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**UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT**

February 1999

**Data Assimilation
Meteorological Office
London Rd
Bracknell
Berkshire
RG12 2SZ**

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure

or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of $>60 \text{ m s}^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of $x.5$ are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference $> 60 \text{ m s}^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure Parameter

- | | |
|---|---|
| 4 | Mean wind vectors |
| 5 | Mean observation - background wind vector |
| 6 | Mean observation-background speed (m s^{-1}) |
| 7 | RMS observation-background vector (m s^{-1}) |

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of $x.5$ are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
7. January 1998. Increase in resolution of UKMO global forecast model.
8. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
9. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
10. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
11. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
12. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).

TABLE 1

**MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: February 1999**

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00, 06, 12, 18 UTC
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:NGE	:Number of observations with gross errors.
:PGE	:Percentage of observations with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. a positive bias indicates the observation is veered to the background.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:
	1. bias	≥ 4 hPa (pressure), ≥ 5 m s^{-1} (wind speed), ≥ 30 degrees (direction).
	2. SD	≥ 6 hPa (pressure), ≥ 80 degrees (direction).
	3. PGE	≥ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
BBXX	ALL	P	SUR	49	0	0	1.9	-5.4	5.7
ELUB5	ALL	P	SUR	52	0	0	3.9	6.6	7.7
ELVI2	ALL	P	SUR	49	0	0	1.0	-4.9	5.0
LAXS2	ALL	P	SUR	40	0	0	1.7	4.6	4.9
PEXX	ALL	P	SUR	38	0	0	2.3	-4.3	4.9
P3YS5	ALL	P	SUR	45	0	0	1.4	4.1	4.3
UAIS	ALL	P	SUR	52	0	0	0.8	-6.2	6.3
UCUF	ALL	P	SUR	20	4	20	2.8	8.4	8.9
VVGG	ALL	P	SUR	30	0	0	1.6	5.9	6.1
WDZB	ALL	P	SUR	43	0	0	1.3	-5.6	5.8
ZCAM9	ALL	P	SUR	49	0	0	2.1	7.7	8.0
3ECI8	ALL	P	SUR	25	0	0	2.1	-4.7	5.2
3FGN3	ALL	P	SUR	23	1	4	1.4	-8.1	8.3
3FGQ3	ALL	P	SUR	46	0	0	1.0	9.3	9.4
3FPB6	ALL	P	SUR	26	0	0	2.3	-4.5	5.1
48102	ALL	P	SUR	204	195	96	0.6	-0.9	1.0
9MCM	ALL	P	SUR	53	0	0	1.4	4.8	5.0
WIND SPEED									
C6JE5	ALL	SPEED	SUR	134	0	0	3.2	-6.7	7.4
DUQM	ALL	SPEED	SUR	34	0	0	2.7	10.8	11.1
DXQC	ALL	SPEED	SUR	24	0	0	3.6	6.8	7.7
ELVG7	ALL	SPEED	SUR	24	0	0	10.0	7.8	12.7
FNIA	ALL	SPEED	SUR	23	4	17	8.0	5.4	9.7
FNOQ	ALL	SPEED	SUR	28	0	0	3.0	-5.1	5.9
GBRH	ALL	SPEED	SUR	24	0	0	2.0	-8.4	8.7
OXRA6	ALL	SPEED	SUR	41	0	0	3.7	5.2	6.4
OXTS2	ALL	SPEED	SUR	99	0	0	4.7	5.0	6.9
PFEU	ALL	SPEED	SUR	45	0	0	5.7	5.1	7.7
PFUA	ALL	SPEED	SUR	32	0	0	7.2	6.0	9.4
PJAG	ALL	SPEED	SUR	50	0	0	5.7	7.4	9.4
PJOX	ALL	SPEED	SUR	44	4	9	5.9	6.4	8.7
PPXU	ALL	SPEED	SUR	26	0	0	3.9	5.1	6.4
P3XH7	ALL	SPEED	SUR	23	0	0	4.3	7.9	8.9
UCUF	ALL	SPEED	SUR	26	0	0	6.2	5.5	8.3
VRUZ7	ALL	SPEED	SUR	21	4	19	6.6	12.3	14.0
3FDZ5	ALL	SPEED	SUR	22	0	0	2.7	5.2	5.9
3FTW	ALL	SPEED	SUR	56	0	0	4.6	6.1	7.6
62136	ALL	SPEED	SUR	109	1	1	3.5	5.0	6.1
9MBQ4	ALL	SPEED	SUR	28	0	0	4.7	8.4	9.6
9MUG	ALL	SPEED	SUR	63	2	3	4.7	6.9	8.4
9VVD	ALL	SPEED	SUR	22	0	0	1.8	-5.6	5.9
9VWH	ALL	SPEED	SUR	59	19	32	13.5	-1.2	13.5
WIND DIRECTION									
46053	ALL	DIRN.	SUR	40	0	0	15.9	-39.9	42.9
46181	ALL	DIRN.	SUR	152	0	0	47.1	-42.7	63.6
62203	ALL	DIRN.	SUR	25	1	4	9.2	31.1	32.4
9VWH	ALL	DIRN.	SUR	33	19	58	101.6	35.8	107.7

FIGURE 1

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 21036

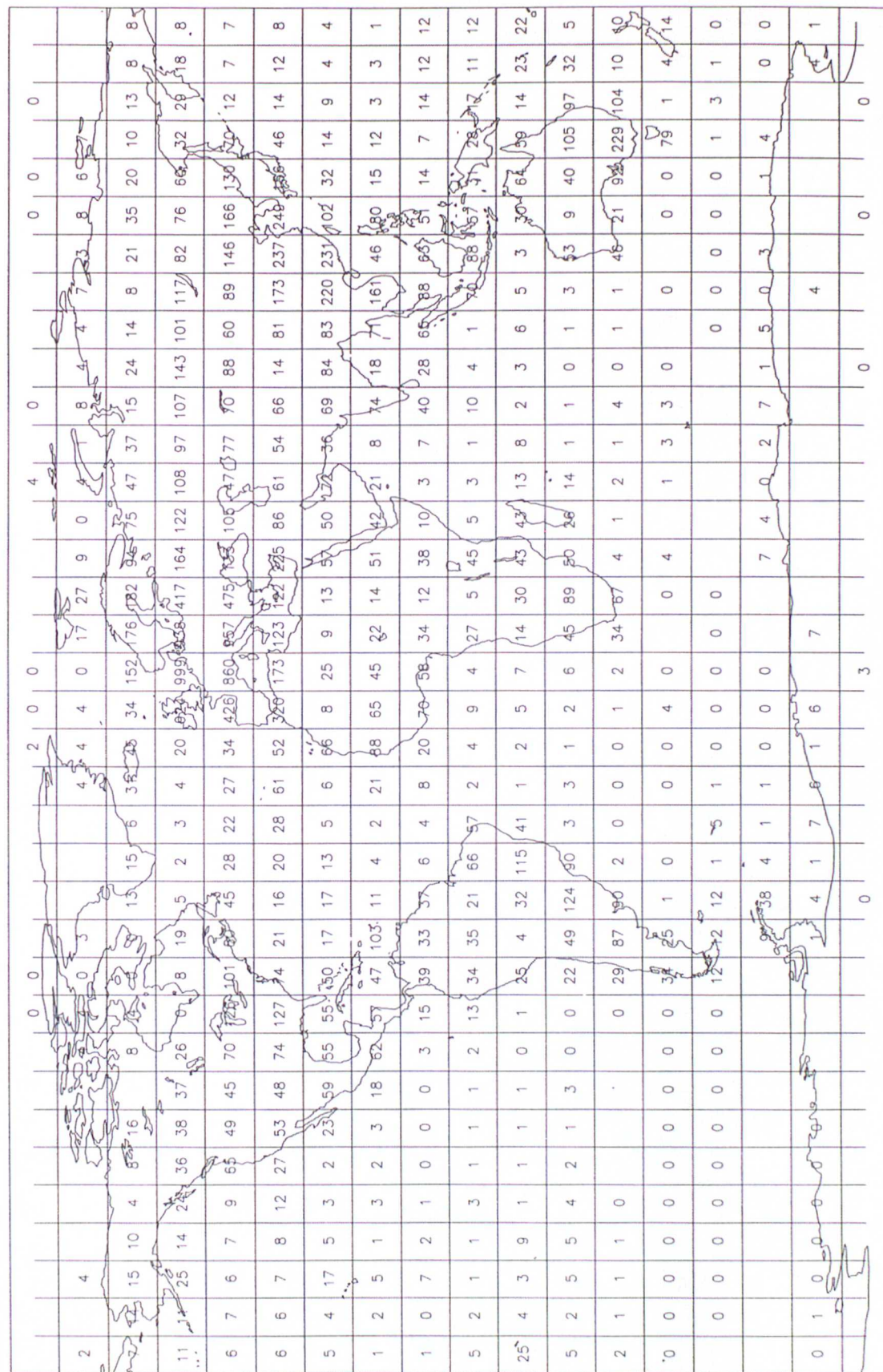


TABLE 2

**MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: February 1999**

Monitoring procedures

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for drifting buoys.	
Standard of comparison	:Background field from Bracknell global model.	
Position	:Average latitude and longitude for period.	
Observation times	:00, 06, 12, 18 UTC	
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).	
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. a positive bias indicates the observation is veered to the background.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1}	(pressure) (vector wind)
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:
	1. bias	≥ 4 hPa (pressure), ≥ 5 m s^{-1} (wind speed), ≥ 30 degrees (direction).
	2.SD	≥ 6 hPa (pressure), ≥ 80 degrees (direction).
	3.PGE	≥ 25 .

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
------------	------	-------	------	------	-------	------	-----	-----	----	------	-----

MEAN SEA LEVEL PRESSURE

17545	-37.1	-12.3	ALL	P	SUR	316	0	0	1.7	-5.4	5.6
46609	57.6	-172.3	ALL	P	SUR	54	54	100	0.0	0.0	0.0
46913	53.2	-145.6	ALL	P	SUR	25	16	64	1.4	12.5	12.6
53903	-18.7	76.8	ALL	P	SUR	258	10	4	6.6	-1.9	6.8
71554	-57.8	1.0	ALL	P	SUR	29	26	90	1.8	-12.1	12.3

WIND SPEED

21531	38.3	-154.4	ALL	SPEED	SUR	460	0	0	3.1	-7.7	8.3
46551	40.5	-148.7	ALL	SPEED	SUR	350	4	1	2.6	-5.2	5.8

WIND DIRECTION

21531	38.3	-154.4	ALL	DIRN.	SUR	59	0	0	16.9	-35.0	38.8
46560	38.9	-129.8	ALL	DIRN.	SUR	286	0	0	34.6	-79.1	86.3
46632	59.0	-146.5	ALL	DIRN.	SUR	314	1	0	71.9	33.9	79.5
55587	-41.1	164.8	ALL	DIRN.	SUR	475	0	0	44.3	51.3	67.7

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5654

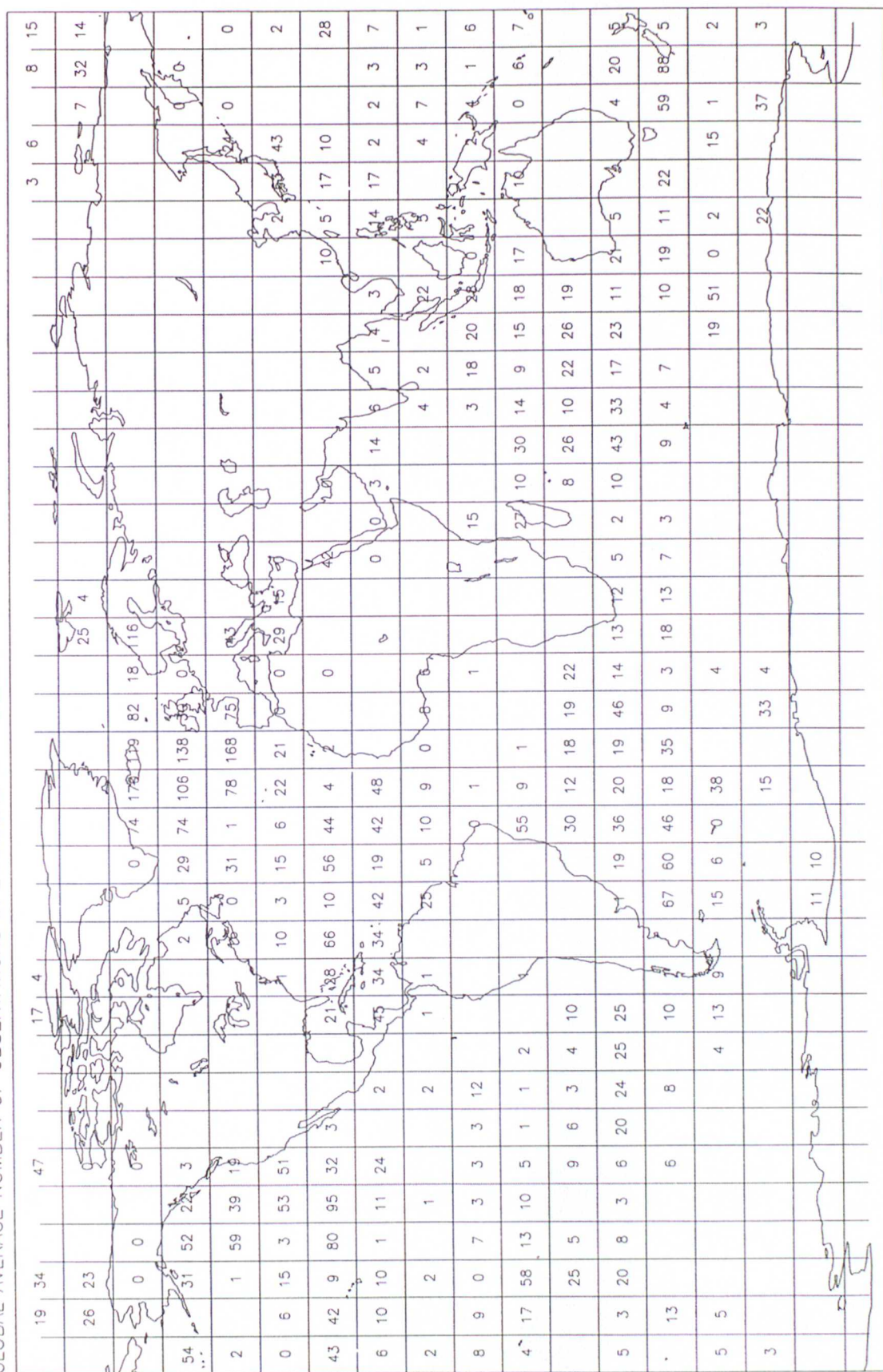


TABLE 3

**MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: February 1999**

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1. bias	≥ 4 hPa
	2. SD	≥ 6 hPa
	3. PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	104	0	0	0	0.8	4.6	4.7
60468	35.6N	6.2E	1052	S8	105	105	100	0	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	104	93	89	0	5.2	12.9	13.9
60535	34.7N	3.3E	1144	S8	76	0	0	0	0.9	-7.0	7.1
60571	31.6N	2.2W	773	S8	106	0	0	1	1.1	-4.5	4.6
60670	24.6N	9.5E	1054	S8	107	1	1	2	1.5	9.2	9.3
63330	13.5N	39.5E	2070	MS	52	51	98	0	0.0	-13.2	13.2
63333	11.1N	39.7E	1903	MS	52	1	2	29	2.2	4.0	4.6
63334	10.3N	37.7E	2515	MS	74	1	1	1	1.1	10.7	10.8
63402	7.7N	36.8E	1725	MS	62	0	0	0	0.8	7.8	7.8
63450	9.0N	38.8E	2354	MS	86	0	0	0	0.7	5.4	5.4
63471	9.6N	41.9E	1260	MS	81	1	1	0	0.8	10.8	10.8
63478	5.9N	43.6E	295	MS	50	0	0	0	2.0	7.1	7.4
68350	26.7S	27.1E	1351	S8	61	1	2	77	4.8	9.4	10.6
68396	26.5S	31.3E	641	S8	45	0	0	0	0.9	4.6	4.7

WMO REGION 2:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23383	66.9N	93.5E	278	M	97	0	0	0	2.2	5.9	6.3
24382	66.4N	143.2E	196	MS	52	0	0	37	3.3	6.8	7.6
24671	63.9N	135.9E	402	MS	108	4	4	0	2.6	9.9	10.2
24688	63.3N	143.2E	741	MS	107	26	24	0	4.9	4.9	6.9
25621	64.0N	158.9E	683	MS	108	4	4	38	5.6	4.3	7.1
30320	56.9N	105.7E	669	MS	110	56	51	0	1.7	0.6	1.8
30439	55.1N	109.8E	465	MS	110	0	0	5	2.7	4.2	5.0
30549	54.2N	112.0E	1302	S8	76	8	11	20	3.3	-4.4	5.5
30664	53.5N	115.6E	811	MS	25	0	0	16	1.4	-5.3	5.5
30741	52.8N	110.0E	1286	S8	105	2	2	13	1.9	-5.1	5.4
30815	51.5N	103.6E	1442	S8	54	1	2	11	1.5	-4.0	4.3
30967	49.9N	115.8E	623	MS	96	2	2	3	3.7	-4.0	5.4
31123	57.8N	130.9E	255	MS	55	0	0	31	3.3	5.5	6.4
31474	51.6N	133.3E	384	MS	109	0	0	2	2.7	5.4	6.0
31532	50.9N	132.3E	272	MS	110	0	0	46	1.9	4.4	4.8
40743	36.2N	57.7E	941	MS	99	0	0	0	1.2	-5.3	5.4
40762	35.3N	59.2E	1333	MS	99	20	20	1	1.4	-13.5	13.6
41254	23.1N	57.7E	1755	S8	81	81	100	0	0.0	0.0	0.0
41396	16.0N	48.9E	700	MS	26	2	8	4	1.1	6.9	7.0
41535	34.2N	73.3E	1308	8	49	0	0	0	1.1	-6.5	6.6
44212	50.0N	92.1E	940	MS	100	5	5	6	2.6	4.8	5.5
44237	48.5N	101.4E	1510	MS	100	3	3	5	1.6	-4.0	4.3
44239	48.8N	103.6E	1209	MS	102	2	2	0	1.2	-6.7	6.8
44256	49.6N	114.4E	706	MS	100	1	1	9	2.1	-6.0	6.4
44272	47.8N	96.9E	1761	MS	99	0	0	2	1.9	-4.6	5.0
44275	46.8N	98.1E	2255	MS	98	1	1	3	1.9	-6.5	6.8
44277	46.4N	96.3E	2182	MS	102	1	1	2	1.1	-4.2	4.3
44282	47.4N	101.5E	1693	MS	98	0	0	0	1.1	-4.0	4.1
44285	46.9N	102.8E	1662	MS	100	0	0	1	2.1	-4.2	4.7
44287	46.1N	100.7E	1860	MS	101	1	1	0	1.1	-4.7	4.8
44288	46.3N	102.8E	1813	MS	102	1	1	0	1.0	-5.4	5.5
44294	47.3N	107.5E	1429	MS	97	2	2	3	2.2	-5.2	5.6
44298	46.4N	108.2E	1287	MS	102	0	0	1	1.2	-5.5	5.6
44302	47.8N	112.1E	926	MS	96	1	1	4	2.1	-5.1	5.5
44304	47.3N	110.6E	1035	MS	94	0	0	1	1.5	-4.3	4.6
44305	46.7N	113.3E	982	MS	100	0	0	0	1.3	-4.4	4.6
44313	47.6N	118.6E	689	MS	97	0	0	2	1.5	-5.8	6.0
44336	45.4N	103.9E	1317	MS	89	1	1	0	1.5	-5.9	6.1
44341	45.8N	106.3E	1396	MS	94	0	0	1	1.6	-6.1	6.3
44347	44.4N	105.3E	1297	MS	95	1	1	1	1.1	-6.4	6.5

WMO REGION 2:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
44352	45.7N	112.4E	1101	MS	97	0	0	1	1.4	-4.4	4.6
44354	44.9N	110.1E	936	MS	101	1	1	1	1.3	-5.1	5.3
44373	43.6N	104.4E	1465	MS	105	0	0	1	1.6	-5.7	5.9
44416	28.6N	81.6E	720	MS	56	2	4	2	1.9	4.2	4.6
44477	27.0N	87.4E	1445	S8	46	46	100	0	0.0	0.0	0.0
47022	40.8N	128.2E	1200	S	37	1	3	16	1.4	4.4	4.6
51133	46.7N	83.0E	535	MS	111	0	0	6	2.1	-4.0	4.5
51288	45.4N	90.5E	1651	S	111	0	0	2	1.5	-5.9	6.1
51334	44.6N	82.9E	321	M	111	0	0	27	3.0	8.2	8.7
51379	44.0N	89.6E	794	M	111	0	0	32	2.6	7.0	7.5
51495	43.5N	91.6E	874	M	109	0	0	65	2.5	9.7	10.0
51573	42.9N	89.2E	37	MS	109	0	0	20	2.7	-6.9	7.4
51765	40.6N	87.7E	847	MS	111	0	0	0	1.4	-4.0	4.2
52203	42.8N	93.5E	739	MS	111	0	0	2	1.6	-4.8	5.1
52267	41.9N	101.1E	941	MS	111	0	0	0	1.1	-4.4	4.5
52495	40.8N	104.5E	1329	MS	111	0	0	0	1.2	-4.1	4.3
52602	38.8N	93.4E	2734	S	111	0	0	0	1.4	-7.4	7.5
52866	36.6N	101.8E	2262	S	111	0	0	0	1.2	-7.8	7.9
52955	35.6N	100.8E	3201	S	79	0	0	67	1.1	6.7	6.8
53149	42.5N	110.1E	1223	MS	110	0	0	0	1.2	-5.0	5.1
53231	41.4N	106.4E	1510	S	111	0	0	0	1.3	-4.2	4.4
53336	41.6N	108.5E	1290	MS	110	1	1	0	1.2	-4.9	5.0
53513	40.8N	107.4E	1041	MS	110	2	2	1	1.5	-4.6	4.8
53588	39.0N	113.5E	2898	S	110	110	100	0	0.0	0.0	0.0
54386	41.4N	128.2E	1018	M	110	0	0	15	2.8	5.0	5.7
54587	39.1N	123.2E	-23	M	79	0	0	3	1.9	-4.5	4.9
56021	34.1N	95.8E	4176	S	111	0	0	0	1.1	-7.3	7.4
56029	33.0N	97.0E	3682	S	111	0	0	0	1.1	-4.2	4.3
56065	34.7N	101.6E	3500	S	111	0	0	0	1.1	-4.8	4.9
56106	31.9N	93.8E	4024	S	107	2	2	1	1.1	-5.0	5.1
56116	31.4N	95.6E	3874	S	110	1	1	1	1.1	-4.0	4.1
56144	31.8N	98.6E	3184	S	56	1	2	4	1.5	-10.0	10.1
56172	31.9N	102.2E	2666	S	111	0	0	4	2.2	-5.2	5.6
56385	29.5N	103.3E	3049	S	111	0	0	16	2.4	-9.7	10.0
56444	28.5N	98.9E	3488	S	110	20	18	15	0.9	13.3	13.3
56462	29.0N	101.5E	2994	S	109	0	0	0	1.9	6.1	6.4
56954	22.6N	99.9E	1054	M	111	0	0	0	1.6	4.2	4.5

WMO REGION 3:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	27	0	0	0	1.5	-6.0	6.2
82336	3.1S	58.4W	40	MS	77	0	0	32	1.9	-4.2	4.6
82704	7.6S	72.7W	170	MS	75	0	0	0	1.3	-4.5	4.7
83235	12.4S	46.4W	604	MS	79	0	0	0	1.2	6.1	6.2
83319	14.7S	52.4W	315	MS	66	1	2	0	1.7	-4.3	4.6
83332	14.1S	46.4W	826	MS	79	8	10	1	1.1	13.1	13.1
83408	14.3S	43.8W	447	MS	68	0	0	0	1.1	9.4	9.5
83423	16.7S	49.3W	741	MS	79	0	0	0	1.3	-5.8	5.9
83488	17.8S	42.9W	1097	S	75	75	100	0	0.0	0.0	0.0
83531	18.6S	46.5W	940	MS	75	1	1	1	1.0	-6.8	6.9
83587	19.9S	43.9W	850	MS	75	0	0	3	1.3	-6.8	6.9
83773	23.1S	48.9W	793	S	23	0	0	0	1.2	-5.8	5.9
84401	5.2S	80.6W	49	MS	84	0	0	0	1.3	4.5	4.7
84455	6.5S	76.4W	281	MS	55	0	0	4	1.8	4.4	4.8
84472	7.1S	78.5W	2620	S	39	0	0	0	0.7	-6.6	6.6
84686	13.6S	72.0W	3248	S	78	0	0	0	1.0	-7.4	7.5
84735	15.5S	70.2W	3826	S	52	0	0	0	1.3	-4.8	5.0
84782	18.1S	70.3W	468	MS	82	0	0	0	1.4	6.1	6.3
85406	18.3S	70.3W	55	M	109	0	0	0	1.2	4.1	4.3
85836	43.6S	71.8W	277	M	41	0	0	0	2.5	5.4	6.0

WMO REGION 4:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70267	64.0N	145.7W	391	MS	94	0	0	18	3.7	5.3	6.5
70271	62.2N	145.5W	481	MS	79	7	9	25	3.0	8.6	9.1
71909	63.8N	68.6W	34	MS	96	0	0	14	1.6	4.2	4.5
71975	64.9N	63.6W	583	MS	109	0	0	5	1.8	-4.2	4.6
76113	30.7N	111.7W	419	MS	80	0	0	35	1.5	4.5	4.7
76118	30.4N	109.7W	1040	MS	35	0	0	0	0.9	-11.7	11.7
76625	20.6N	100.4W	1813	MS	21	0	0	0	0.7	-7.7	7.7
76632	20.1N	98.7W	2417	MS	31	0	0	0	0.6	-5.8	5.8
76658	19.2N	103.7W	494	MS	42	0	0	2	1.3	6.6	6.7
76750	18.5N	88.3W	9	MS	86	0	0	0	1.8	-8.6	8.8
76775	17.1N	96.7W	1550	MS	48	1	2	0	1.0	4.2	4.3
76845	16.7N	92.6W	2276	MS	62	62	100	0	0.0	0.0	0.0
78718	14.4N	87.6W	626	MS	58	45	78	0	0.6	-14.2	14.2

WMO REGION 5:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91163	21.9N	159.6W	7	8	265	265	100	0	0.0	0.0	0.0
94328	22.4S	133.6E	623	MS	102	0	0	0	0.8	6.0	6.1
94955	41.6S	145.7E	684	MS	105	105	100	0	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	106	106	100	0	0.0	0.0	0.0
96505	3.7N	115.7E	932	S8	37	34	92	3	4.4	-2.3	5.0
96751	6.7S	106.9E	959	S	60	60	100	0	0.0	0.0	0.0
97700	3.3S	127.1E	20	M	43	0	0	81	2.2	-7.9	8.2

WMO REGION 6:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
04207	81.7N	59.9W	105	MS	103	0	0	10	2.0	-5.5	5.9
04231	67.0N	50.7W	50	MS	324	0	0	7	2.3	4.8	5.3
04270	61.2N	45.4W	34	MS	105	0	0	24	2.4	4.4	5.0
07560	44.1N	3.6E	1567	S8	326	0	0	2	1.7	-4.3	4.6
11130	47.6N	12.2E	495	MS	110	0	0	19	1.2	4.0	4.2
11146	47.1N	13.0E	3105	S7	81	4	5	35	2.1	-4.7	5.1
11180	47.7N	15.8E	1546	S8	107	0	0	22	1.7	-4.6	4.9
11343	47.1N	13.0E	3105	S	110	0	0	36	2.0	-4.4	4.8
12510	50.7N	15.7E	1603	S8	108	0	0	28	2.4	-4.7	5.3
16614	40.4N	21.3E	604	MS	88	0	0	0	1.0	-6.9	7.0
17092	39.8N	39.5E	1218	S8	111	0	0	0	1.2	9.1	9.2
17203	38.9N	40.5E	1177	S8	107	0	0	10	1.1	4.2	4.3

ANTARCTIC:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	S	23	0	0	0	2.0	6.1	6.4
89272	75.0S	70.8W	1395	S	167	120	72	47	1.0	-13.5	13.5
89345	81.7S	148.8W	620	S	352	352	100	15	0.0	0.0	0.0

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Statistics for each airline carrier.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:All hours combined.
Level(s) monitored	:70.0 - 500.0 hPa
Elements monitored	:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	
:N REP.	:Number of observations received excluding duplicates.
:PG	:Percentage of observations with gross errors.
:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC	:Percentage of observations with calm winds.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind
SELECTION CRITERIA	:N REP ≥ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
AAA	76	0	16	1.4	0.5		73	0	16	0	7.7	0.7
AAH	46	0	39	2.3	0.5		47	0	36	0	11.5	1.6
AAL	4343	1	29	1.9	0.0		3758	0	22	0	9.0	0.9
AAR	1174	1	6	2.2	-0.5		1179	0	6	0	8.7	-0.3
ACA	1795	1	14	2.2	-0.1		1668	0	7	0	7.6	0.7
ACI	34	3	24	1.1	0.5		34	0	21	0	6.9	-1.0
AEA	316	1	33	2.5	1.1		263	0	24	0	8.9	1.6
AEL	1069	0	14	1.9	-0.6		1084	0	14	0	9.0	0.3
AEY	192	1	3	1.8	0.8		192	2	5	0	9.0	0.5
AFL	511	1	8	2.2	0.8		491	0	6	0	8.5	0.3
AFR	2111	1	13	1.8	0.0		2108	0	13	0	8.8	0.6
AIH	200	1	13	1.9	0.0		183	0	9	0	9.7	0.6
AJM	122	1	7	1.8	-0.8		121	0	7	0	9.1	1.5
AMM	115	1	19	2.2	0.7		102	0	12	0	8.7	1.2
AMT	591	1	42	2.5	1.2		605	0	41	0	8.3	1.2
AMX	359	3	9	2.1	-0.3		361	1	11	0	10.5	0.7
ANA	1289	0	6	2.0	-0.1		1293	0	7	0	8.4	0.2
ANZ	3045	1	29	1.8	0.1		3008	0	28	0	8.0	1.2
AOM	917	1	7	1.6	0.7		910	0	7	0	8.7	0.7
ARG	32	9	19	3.3	-0.2		32	0	0	0	7.5	1.9
ASY	24	0	29	2.7	1.5		21	0	29	0	9.9	-0.2
AVA	442	0	4	2.0	-0.3		443	0	5	0	8.4	0.7
AVE	95	3	9	1.8	0.7		94	0	6	0	11.8	1.8
AVN	66	3	6	1.7	0.3		59	2	3	0	6.5	0.5
AXA	69	1	22	1.3	0.6		63	0	25	0	12.6	2.3
AZA	619	1	28	2.6	0.1		515	0	18	0	8.3	1.0
BAL	578	0	14	1.9	-0.1		586	0	14	0	7.8	0.9
BAW	1745	1	24	2.2	-0.2		1564	0	17	0	7.8	0.9
BLX	61	0	8	1.2	-0.3		61	0	5	0	7.8	0.4
BWA	398	1	12	2.0	1.4		373	0	8	0	8.9	0.6
CAL	1052	1	8	2.1	-0.1		1053	1	9	0	8.3	0.0
CCA	254	1	13	3.0	0.4		274	0	100	0	15.6	-0.1
CDN	2328	1	12	2.1	0.4		2235	0	9	0	8.0	0.8
CES	280	0	12	2.2	0.1		283	1	27	0	10.1	0.3
CFC	30	3	17	2.2	1.2		35	6	23	0	13.6	1.0
CFG	1137	0	7	1.8	-0.7		1094	0	5	0	8.7	0.4
CKS	262	2	38	1.8	0.3		267	0	39	0	10.7	1.2
CKT	185	2	12	1.9	1.0		174	1	9	0	7.8	0.3
CLX	415	0	13	2.2	-0.6		381	0	6	0	7.8	-0.1
CMI	444	0	7	1.9	1.1		447	0	9	0	10.7	1.5
CMM	356	1	13	2.0	-0.2		346	0	12	0	10.3	1.9
COA	1859	2	32	2.0	0.1		1666	0	26	0	11.5	1.9
CPA	65	0	3	2.1	0.0		64	0	5	0	7.6	0.7
CRL	836	0	6	1.6	0.4		828	0	6	0	8.2	0.7
CSN	82	2	10	2.5	0.7		82	1	10	0	7.2	1.4
CTB	280	2	5	2.0	-0.4		285	0	3	0	6.8	0.5
CUB	509	1	12	1.9	0.8		492	1	10	0	9.8	1.0
DAL	3936	1	37	2.2	0.5		3568	0	33	0	8.3	1.2
DBY	684	1	6	1.8	-0.9		679	0	5	0	8.5	0.5
DLH	2802	1	17	1.9	0.0		2564	0	12	0	7.9	0.5
EEZ	43	2	30	1.2	-0.8		40	8	30	0	9.1	-2.0
EIA	179	3	33	1.4	0.6		178	0	31	0	8.3	2.3
ELY	113	0	10	2.2	-0.3		116	0	11	0	11.1	0.6
EVA	1901	0	7	1.9	-0.2		1934	1	8	0	8.8	-0.1
EWV	89	1	25	2.2	0.0		70	0	10	0	9.7	1.4
FDX	1684	1	23	2.0	0.4		1553	0	18	0	8.9	0.7
FIN	475	1	19	2.0	0.3		388	0	11	0	8.4	0.4
FJI	848	3	30	1.7	0.6		831	0	27	0	7.6	1.2
FOM	150	2	24	1.4	0.0		151	0	23	0	9.0	1.2

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				BIAS
		PG	PR	RMS	PG		PR	PC	RMS		
GAF	31	3	39	2.6	-0.8	20	0	20	0	13.8	-2.5
GHA	62	0	2	1.9	-0.5	62	0	5	0	12.2	0.5
GIA	48	4	25	1.4	0.8	48	0	25	0	9.4	0.9
GRL	28	0	4	1.9	0.4	28	0	4	0	6.1	0.0
GTI	90	0	27	1.4	-0.2	83	1	25	0	7.2	0.6
HAL	2611	0	33	1.8	0.2	2610	0	34	0	10.7	1.3
HLF	92	1	20	2.1	-0.9	80	0	10	0	8.3	1.2
HLQ	39	0	26	2.0	0.7	40	0	23	0	8.2	0.8
HRH	82	2	48	1.1	0.4	79	0	46	0	6.7	1.0
IBE	2755	1	20	2.0	0.2	2597	0	17	0	9.4	0.6
ICE	865	1	27	2.2	0.2	659	0	17	0	8.1	0.3
JAL	6031	0	5	2.0	0.2	6024	0	6	0	8.5	0.5
JAZ	28	0	7	2.4	0.9	28	0	7	0	10.8	-0.3
JKK	208	1	29	2.0	-0.1	166	0	16	0	9.6	0.7
KAL	3098	0	9	2.0	-0.4	3076	0	10	0	9.4	0.3
KLM	2849	0	18	1.9	0.2	2717	0	16	0	8.4	0.6
LAP	34	6	9	1.6	1.0	34	0	100	0	8.1	3.0
LDA	202	2	33	2.1	0.1	167	1	23	0	7.9	1.4
LDI	721	1	28	2.1	-0.8	629	0	21	0	8.4	0.1
LIB	540	1	5	1.9	0.8	543	0	5	0	8.9	0.4
LOT	166	1	22	2.3	-0.7	136	0	12	0	9.1	0.3
LTU	720	0	26	2.2	-0.3	574	0	15	0	8.9	1.4
LXR	39	0	18	1.7	1.0	36	0	11	0	8.3	0.2
MAS	343	0	11	2.0	-0.3	354	0	12	0	8.7	0.3
MDA	41	0	0	1.8	0.0	41	0	0	0	8.6	-1.3
MPD	217	2	23	2.5	0.4	196	0	14	0	9.0	0.7
MPH	837	1	10	2.0	-0.5	805	0	6	0	8.3	0.4
NAL	21	0	24	2.5	0.0	23	0	26	0	9.8	3.8
NCA	563	0	1	1.8	0.2	562	0	2	0	8.4	0.2
NWA	9226	1	11	2.0	0.6	9015	0	10	0	8.7	0.7
OAL	36	0	22	3.1	2.3	35	0	14	0	5.1	1.8
PAC	192	2	28	2.1	0.5	182	1	26	0	10.3	1.7
PAL	878	0	9	1.8	-0.2	842	0	11	0	8.8	0.7
PAO	216	0	35	1.6	0.0	214	0	35	0	8.5	1.5
PAQ	25	0	4	1.3	0.0	25	0	4	0	7.8	0.9
QFA	1657	1	44	1.6	0.3	1646	0	44	0	8.1	0.9
RAF	142	0	1	1.6	1.0	142	0	2	0	7.7	1.0
RAM	76	0	11	2.7	-1.4	76	0	9	0	12.9	0.4
RCH	482	2	26	2.4	0.9	445	1	34	0	10.2	2.0
RKA	118	1	4	1.9	-0.4	119	1	7	0	9.7	0.9
RRR	115	1	25	1.8	0.1	105	0	24	0	7.9	2.1
RYN	250	0	42	2.1	0.6	246	0	42	0	10.9	1.1
RZO	56	4	7	1.5	-0.1	56	0	5	0	11.6	1.9
SAA	308	1	4	2.0	-0.8	303	0	4	0	8.1	0.8
SAB	73	1	26	2.7	-0.4	62	0	16	0	8.4	0.3
SAS	1552	0	1	1.9	-0.1	1548	0	2	0	7.8	0.5
SCX	24	0	46	2.6	0.3	24	0	46	0	8.4	1.1
SEU	126	2	31	2.4	1.1	107	0	21	0	10.8	-0.4
SIA	1006	1	7	2.2	-0.7	1018	0	8	0	8.9	0.3
SLR	232	0	11	1.9	-0.9	239	0	12	0	8.0	0.3
SOL	50	2	6	1.1	0.6	49	0	6	0	8.2	2.4
SSV	20	0	0	1.2	-0.3	20	0	0	0	6.1	-1.2
SVA	99	0	10	2.2	-0.9	105	0	8	0	8.4	1.1
SVV	30	10	37	5.7	4.3	31	3	29	0	15.0	1.2
SWR	149	1	21	1.8	-0.2	133	1	14	0	7.7	0.8
TAP	472	2	10	1.9	-0.4	464	1	8	0	9.4	1.1
TBA	21	10	38	3.2	1.9	21	0	43	0	21.4	-6.3
TCO	23	4	4	2.2	-1.2	25	0	4	0	13.4	1.6
THA	385	0	10	2.2	-0.8	392	1	11	0	8.8	-0.1

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				BIAS
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	
THT	76	1	18	2.1	1.2	80	0	19	0	10.8	0.4
TOW	78	5	23	2.2	-0.2	59	0	8	0	7.8	1.6
TPA	36	3	19	1.3	-0.2	32	0	13	0	6.9	-0.3
TWA	1333	2	31	2.2	0.3	1067	0	23	0	8.5	1.0
UAL	85512	1	84	1.7	-0.2	85641	0	83	0	7.6	0.7
UPS	1341	1	38	1.9	0.2	1245	0	36	0	8.2	0.7
USA	298	2	32	2.0	-0.3	230	0	19	0	7.5	1.3
VIR	402	1	14	2.1	-0.3	365	0	6	0	7.7	0.8
VKG	47	0	2	2.0	0.2	53	0	2	0	11.5	2.3
VRG	94	11	22	3.2	1.0	97	0	31	0	16.9	0.6
VVR	45	0	33	3.2	-1.1	46	0	33	0	8.3	-0.1
WOA	171	0	8	2.0	0.4	167	0	100	0	8.7	0.3
ZKN	1347	0	0	1.1	0.0	1347	0	0	0	6.1	0.4
AN	21076	0	1	1.2	0.2	21076	0	1	0	6.2	0.8
AR	2477	0	100	2.9	2.5	2470	0	29	0	7.3	1.8
BA	31877	0	1	1.5	0.2	31806	0	1	0	6.4	0.6
IT	338	0	64	0.8	-0.2	337	0	64	0	6.0	1.4
KL	10147	0	6	1.8	1.0	10134	0	6	0	6.8	1.1
LH	25	8	28	2.6	0.6	84	0	29	0	16.7	0.5
MK	739	0	1	2.1	1.8	736	0	1	0	8.1	2.0
QF	21888	0	7	1.4	0.5	21867	0	7	0	6.7	1.0
SA	3488	0	1	1.9	1.3	3488	0	1	0	7.1	1.2
SK	633	0	0	1.5	0.0	633	0	17	0	6.7	0.4
SV	1484	0	2	1.7	0.9	1469	1	82	0	7.8	1.1
UA	2301	1	26	2.0	0.0	2475	0	25	0	9.8	1.6
WA	495	8	14	2.1	0.6	490	3	100	0	13.1	-2.5
XX	3801	1	7	1.8	0.4	4389	0	100	0	12.4	1.0
N	603	1	25	2.5	0.6	597	0	25	0	9.6	0.9
ADS	6238	0	11	1.4	-0.1	6238	0	11	0	6.6	0.5
US ACARS	479477	0	14	1.7	0.2	479352	0	14	0	7.1	0.8

FIGURE 4

AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FEBRUARY 1999

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



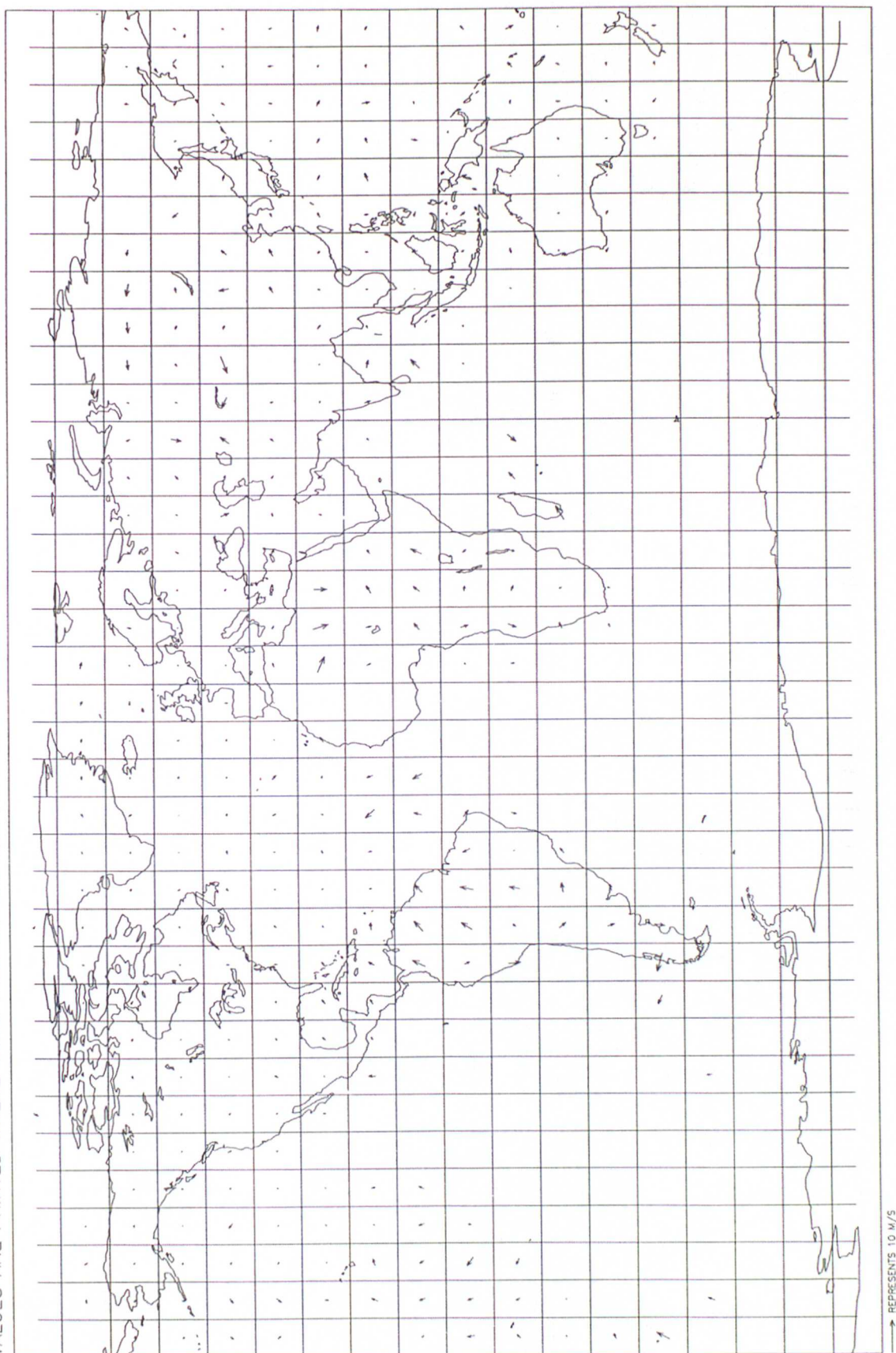
→ REPRESENTS 10 M/S

FIGURE 5

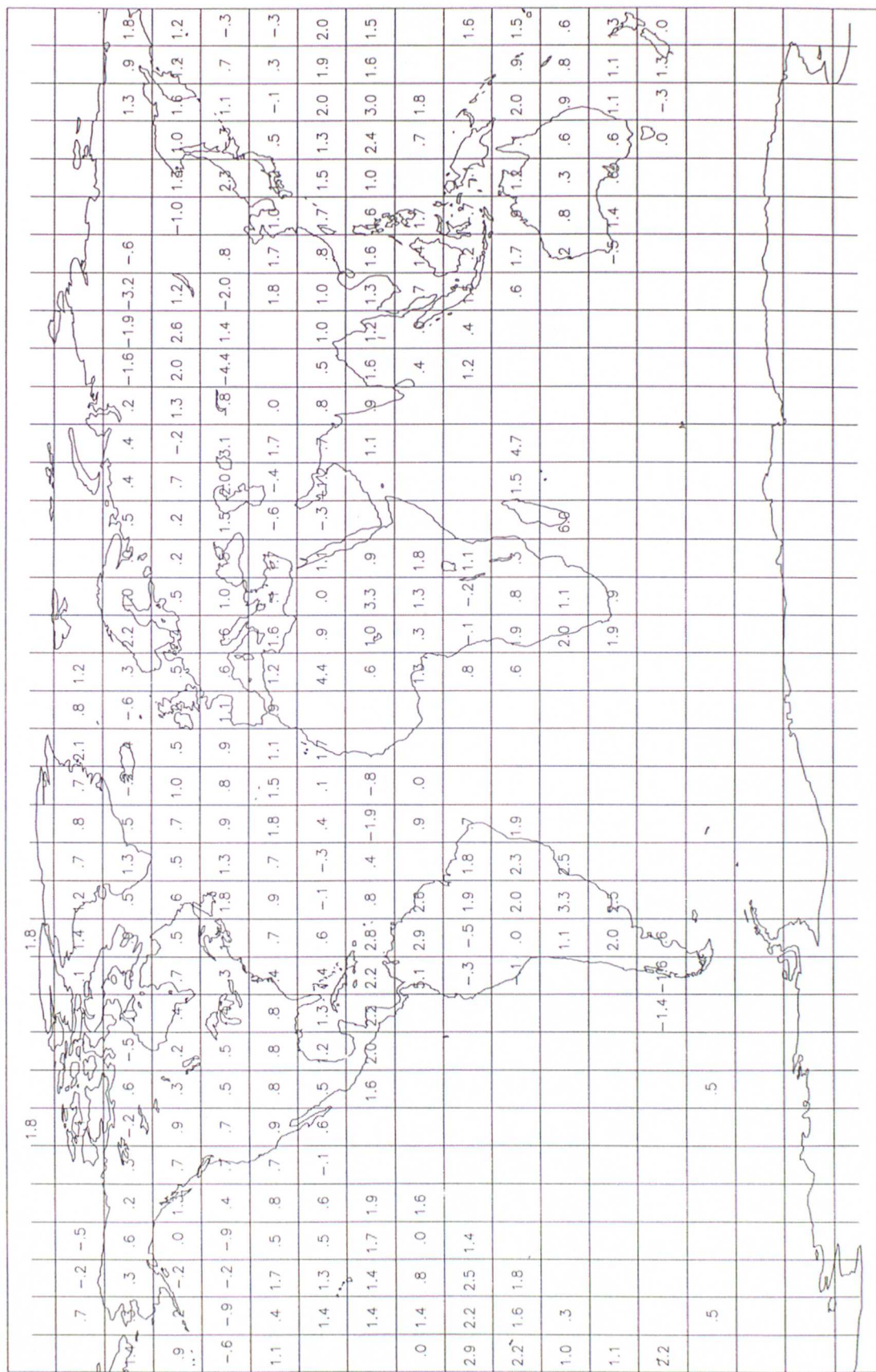
AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA

FEBRUARY 1999

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
 FEBRUARY 1999
 OBSERVATIONS WITH O-B VECTOR DIFFERENCE > 60 MPS EXCLUDED
 VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT



AIRCRAFT : RMS

FEBRUARY 1999

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

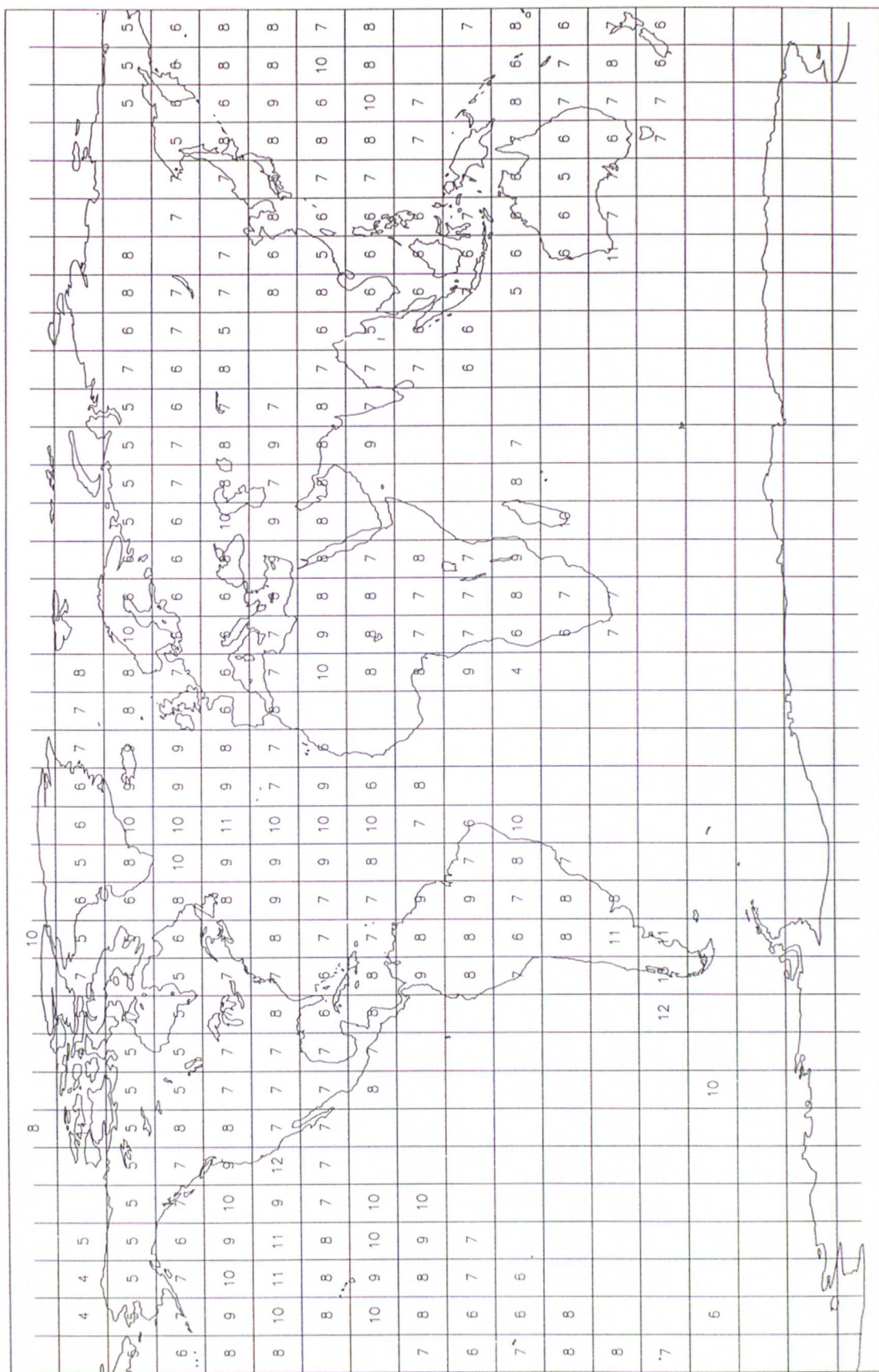


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG		NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
26477	12	Z	200	56/	31	20	0	44.7	91.0	101.5	5
33393	00	Z	250	50/	24	11	0	50.3	83.9	97.8	5
33946	00	Z	50	45/	34	11	0	41.9	163.1	168.4	6
42027	00	Z	250	34/	75	10	0	86.8	-86.4	122.4	5
42101	00	Z	150	30/	76	21	0	59.5	-85.3	104.0	5
42314	00	Z	200	27/	95	22	0	64.3	-57.6	86.3	5
42314	12	Z	150	27/	95	22	0	53.7	-124.6	135.7	5
42369	00	Z	100	27/	81	11	0	95.4	-112.2	147.3	5
42397	00	Z	500	27/	88	21	0	37.7	-48.3	61.2	9
42647	12	Z	100	23/	73	12	1	98.3	104.0	143.1	7
42724	12	Z	250	24/	91	16	0	73.1	-37.4	82.2	5
43003	12	Z	150	19/	73	21	0	68.1	79.7	104.8	4
43150	00	Z	200	18/	83	25	0	60.4	-55.3	81.9	8
43185	12	Z	200	16/	81	21	0	58.3	62.7	85.7	4
43192	00	Z	100	15/	74	22	0	78.3	-97.2	124.8	4
43369	00	Z	100	8/	73	20	0	81.2	-106.0	133.5	5
43371	12	Z	200	8/	77	25	0	65.3	73.5	98.3	4
52533	00	Z	850	40/	98	26	0	11.7	-49.1	50.5	4
57083	12	Z	150	35/	114	23	0	25.3	84.7	88.4	4
65578	12	Z	200	5/	-4	26	0	56.3	58.1	80.9	4
87418	12	Z	850	-33/	-69	17	0	6.7	-36.1	36.7	4
89009	00	Z	1000	-90/	0	1	23	0.0	65.0	65.0	6
89009	12	Z	1000	-90/	0	2	12	53.0	-25.0	58.6	5
89512	00	Z	1000	-71/	12	2	22	1.5	98.5	98.5	10
89512	12	Z	1000	-71/	12	1	12	0.0	96.0	96.0	9
96163	00	Z	150	-1/	100	11	0	101.1	45.7	111.0	4
96237	00	Z	150	-2/	106	7	0	100.7	-17.4	102.2	6
97180	00	Z	500	-5/	120	17	1	53.8	-21.9	58.1	6

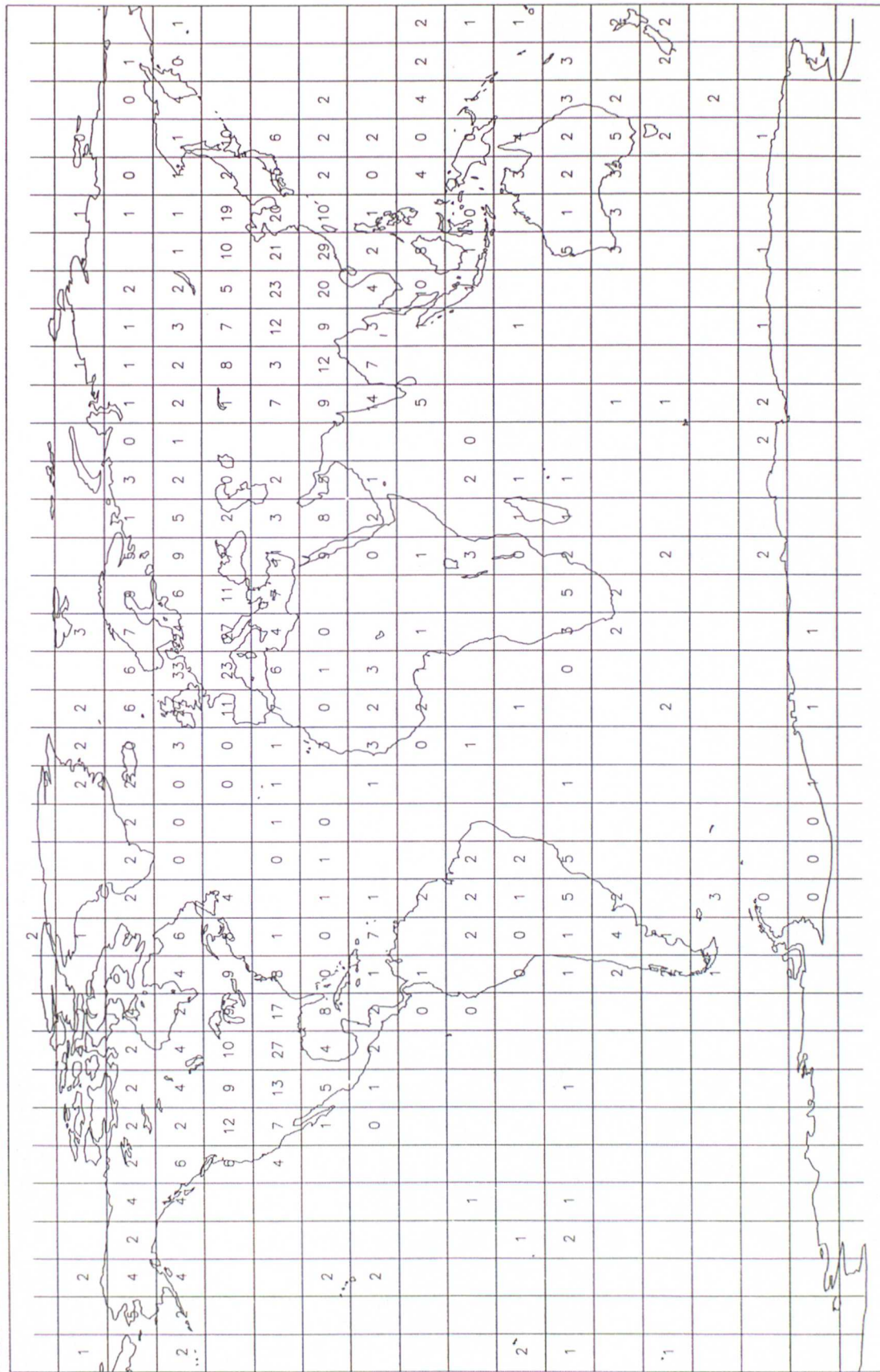


TABLE 6

**MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 1999**

Monitoring procedures

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.	
Area monitored	:90°N - 90°S, 180°W - 180°E.	
Standard of comparison	:Background field from Bracknell global model.	
Observation times	:00 UTC and 12 UTC.	
Level(s) monitored	:Standard levels between 1000.0 - 100.0 hPa	
Element monitored	:VECTOR WIND in m s^{-1}	
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and $\geq 15 \text{ m s}^{-1}$ RMS vector wind.	
	ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN	

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
08301	00	V	250	40/ 3	11	0	18	4.7	9.9	15.1	1
17351	00	V	150	37/ 35	15	0	20	-11.6	0.2	18.7	2
17351	12	V	250	37/ 35	22	0	18	-12.2	-1.3	18.0	4
42369	00	V	250	27/ 81	13	0	7	-3.9	0.5	16.9	2
42397	12	V	200	27/ 88	12	0	16	10.4	-10.0	16.8	1
42410	12	V	300	26/ 92	11	0	18	-12.0	-9.3	21.7	2
42701	00	V	200	23/ 85	12	0	8	10.5	2.3	15.8	1
42724	00	V	400	24/ 91	21	0	0	11.6	6.2	16.3	1
42874	00	V	200	21/ 82	13	0	7	11.5	9.1	17.4	1
53915	00	V	150	36/ 107	12	3	53	26.0	1.6	22.8	3
53915	12	V	150	36/ 107	15	1	75	29.2	0.1	33.3	2
62306	00	V	150	31/ 27	11	0	18	18.2	0.2	21.5	2
62306	12	V	200	31/ 27	13	0	7	14.7	-1.0	19.2	4
62378	00	V	250	30/ 31	21	1	9	-5.2	-4.0	15.3	1
62378	12	V	150	30/ 31	10	0	10	-1.4	-2.4	17.6	1
78486	12	V	300	18/ -70	18	0	27	-11.3	-11.8	17.5	4

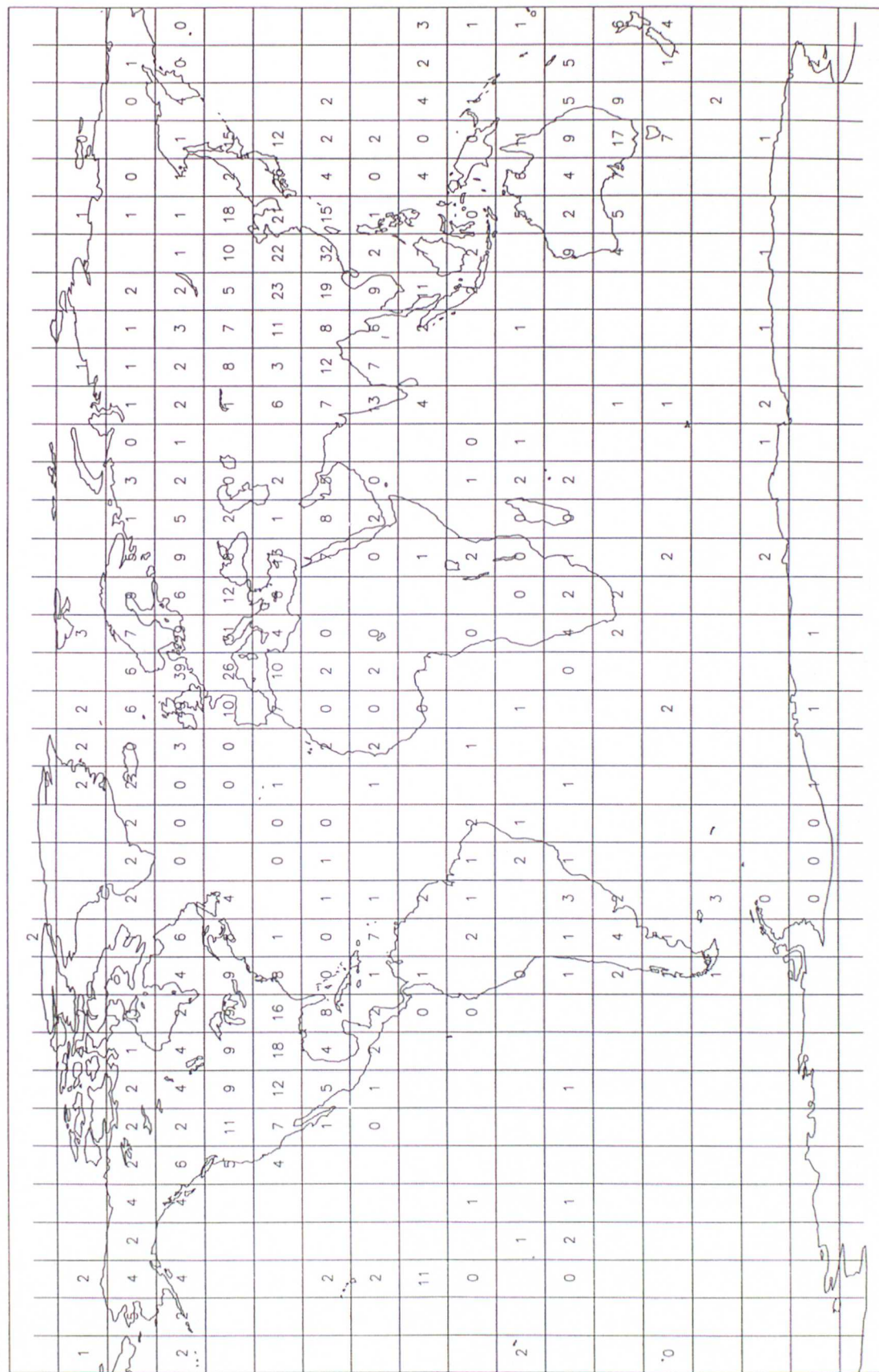


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 500.0 - 150.0 hPa
Element monitored	:WIND DIRECTION in degrees
Parameters monitored	
	:NUM OBS :Average number of observations at all levels.
	:BIAS :Mean difference of observations from background values from all levels.
	:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD :SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5 , and ABSOLUTE BIAS $\geq 10^\circ$, with SD $< 30^\circ$, and MAX SPREAD $< 10^\circ$

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
31510	00	DD	51/ 127	22	-10.8	4.2	12.0
42397	00	DD	27/ 88	11	12.7	2.7	9.9
42397	12	DD	27/ 88	14	14.1	1.8	8.5
48855	00	DD	16/ 108	15	-11.9	7.6	29.1
50527	00	DD	49/ 120	26	10.3	4.0	12.2
62337	00	DD	31/ 34	23	-18.1	4.1	6.3
82824	00	DD	-9/ -64	17	10.4	4.9	29.2

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: February 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA. FIGURE 10
FEBRUARY 1999

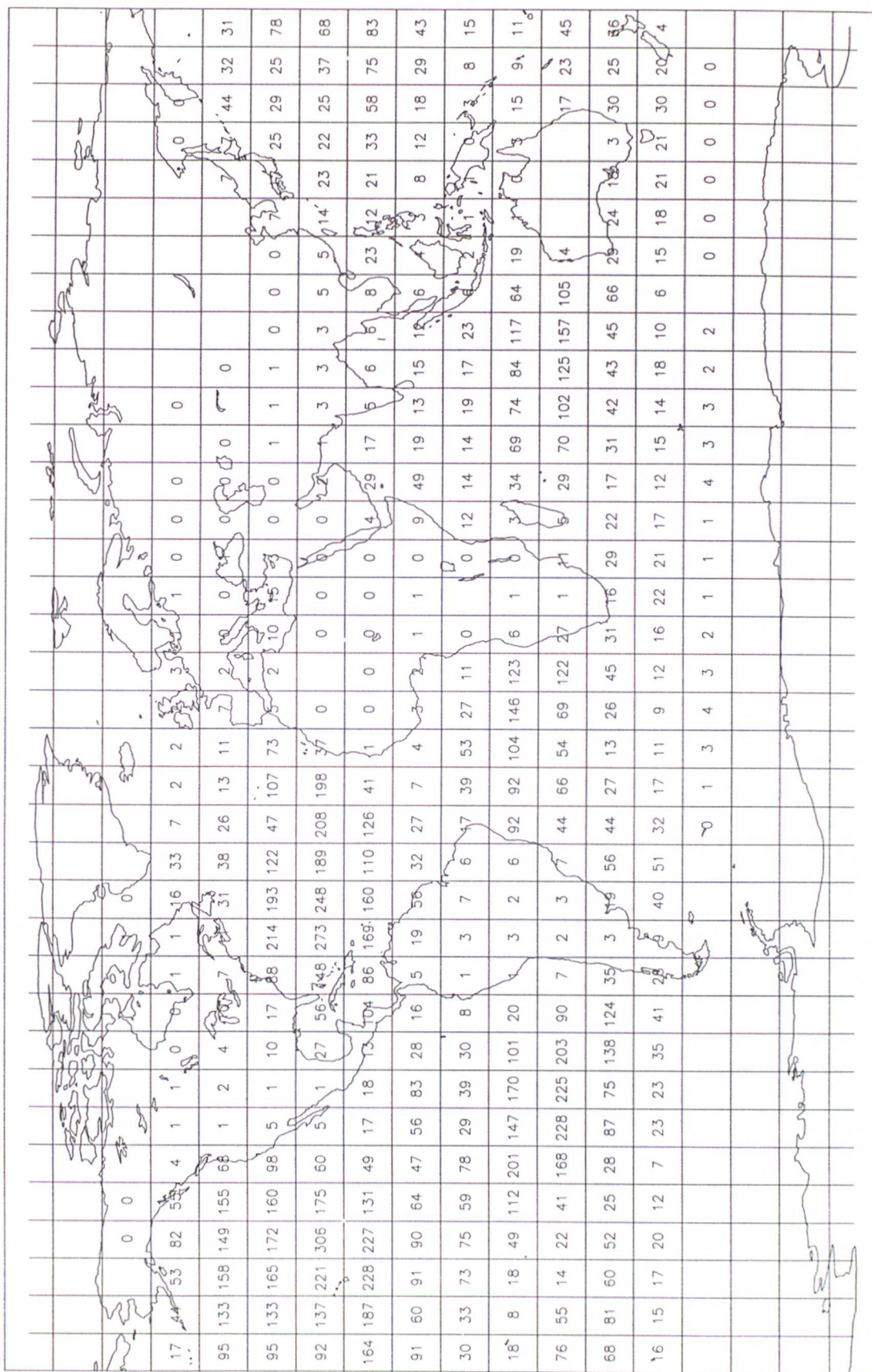


FIGURE 11

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701-1000 HPA

FEBRUARY 1999

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

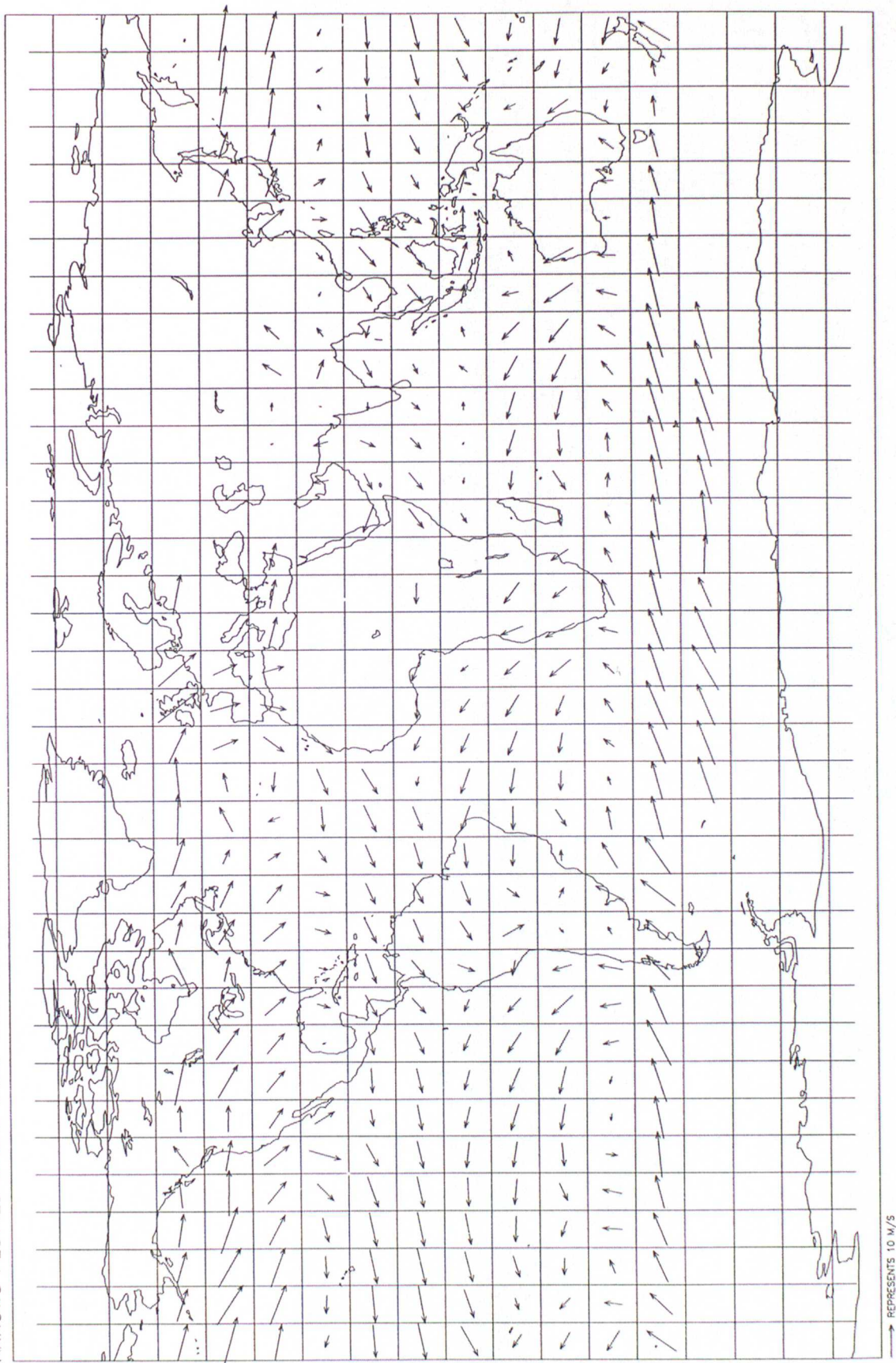
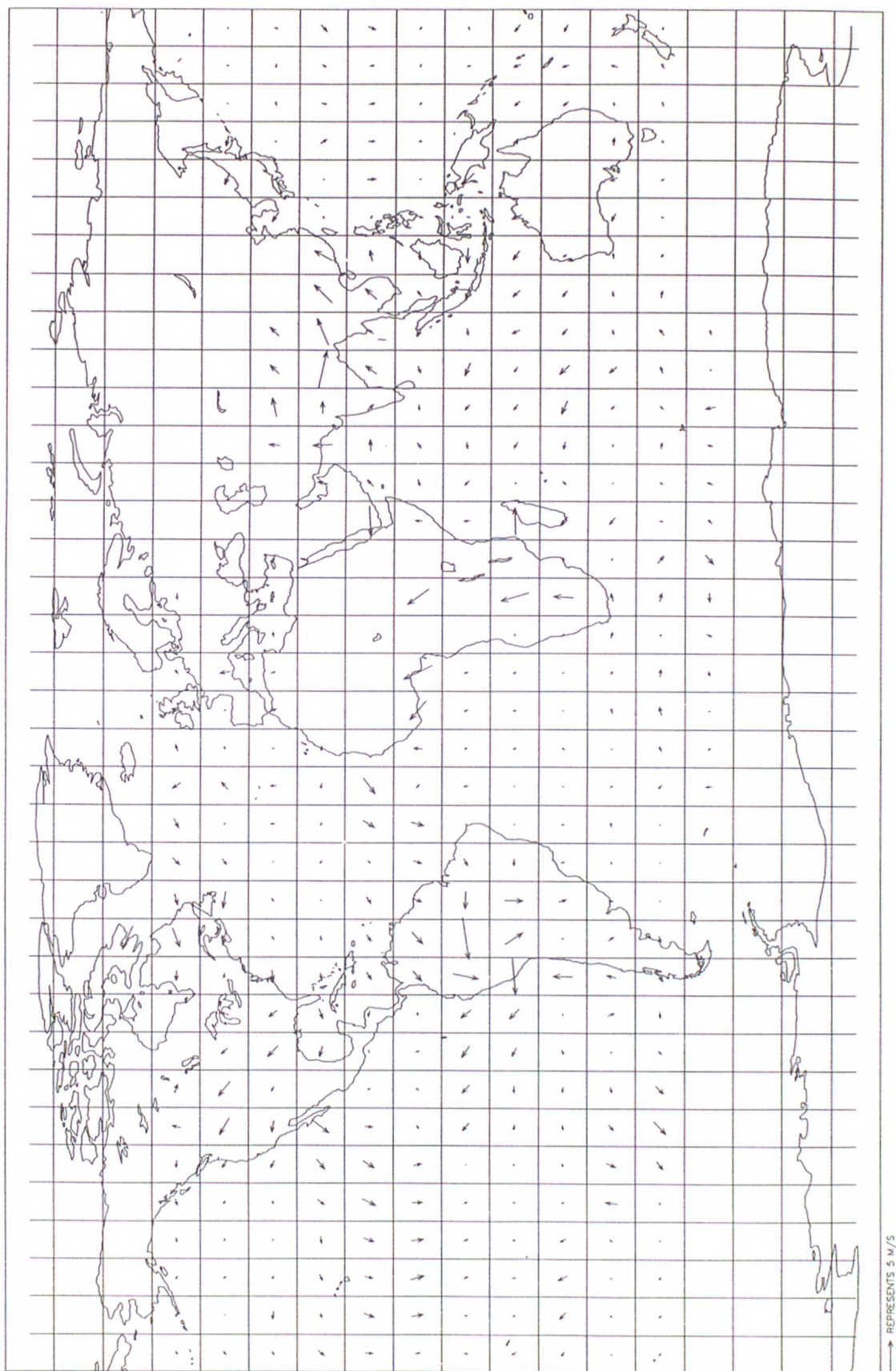


FIGURE 12

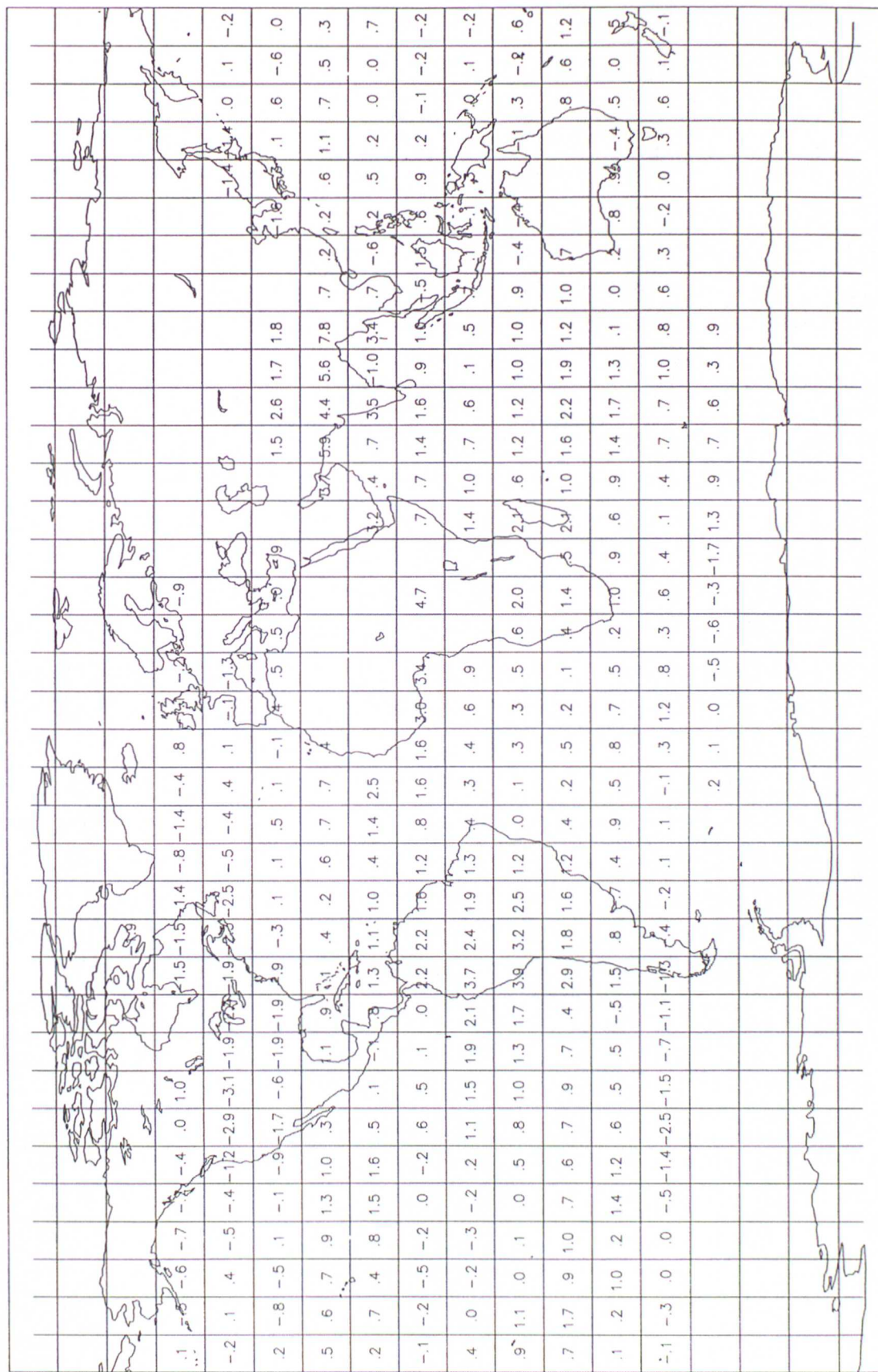
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA
FEBRUARY 1999

ALL OBSERVATIONS

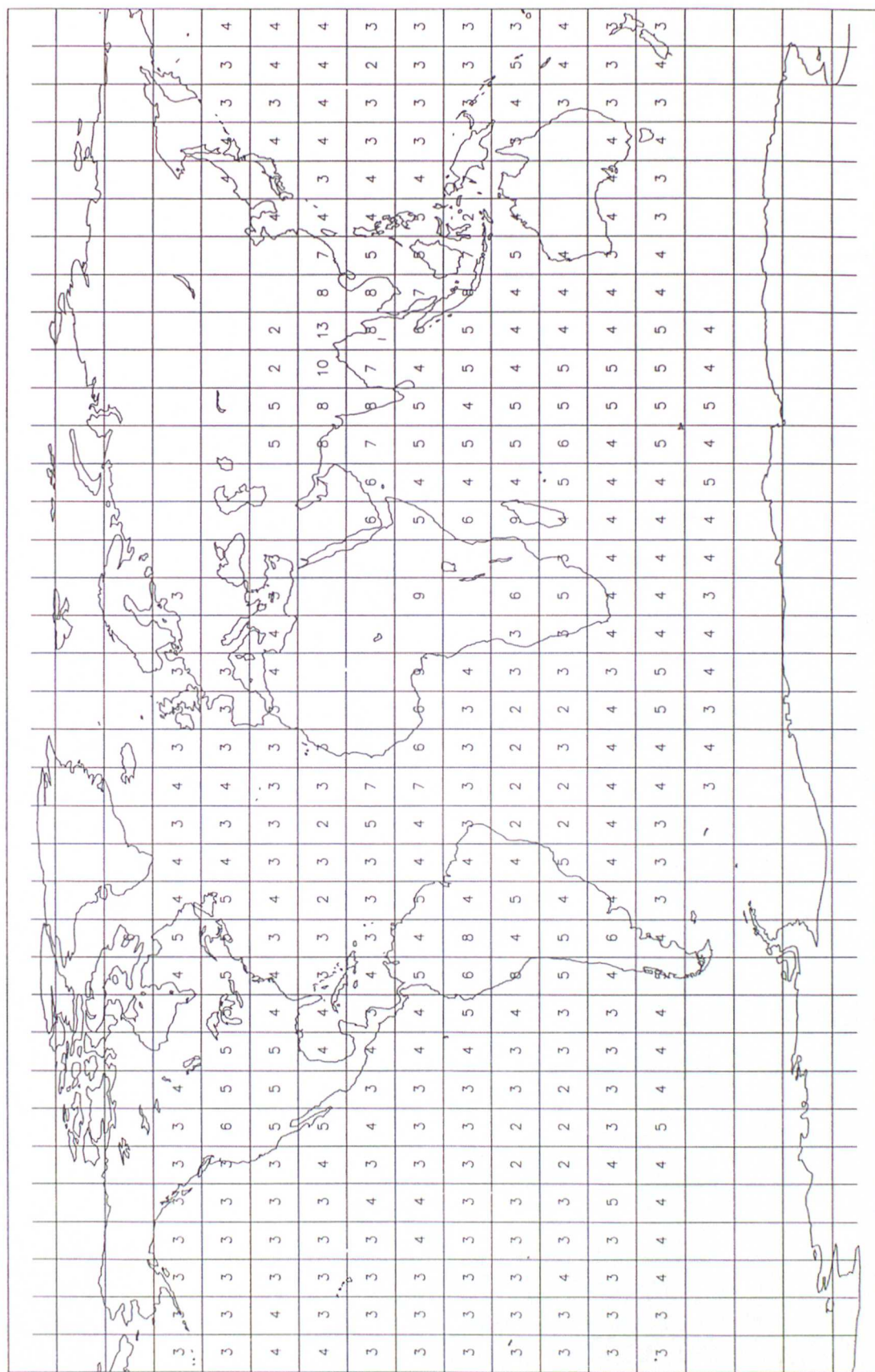
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOB5 : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA
FEBRUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOB5 : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA
FEBRUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
FEBRUARY 1999

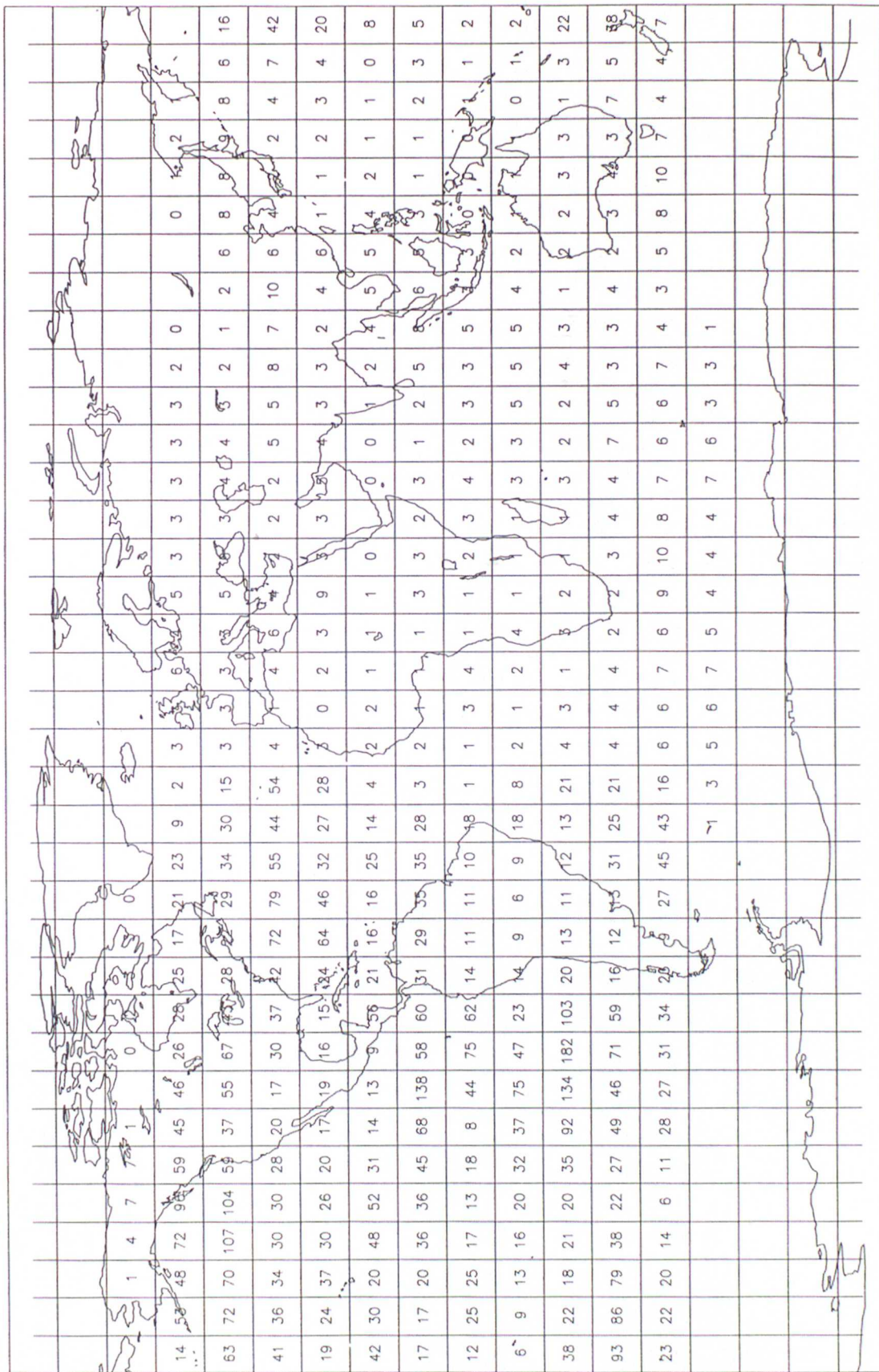


FIGURE 16

SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA
FEBRUARY 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

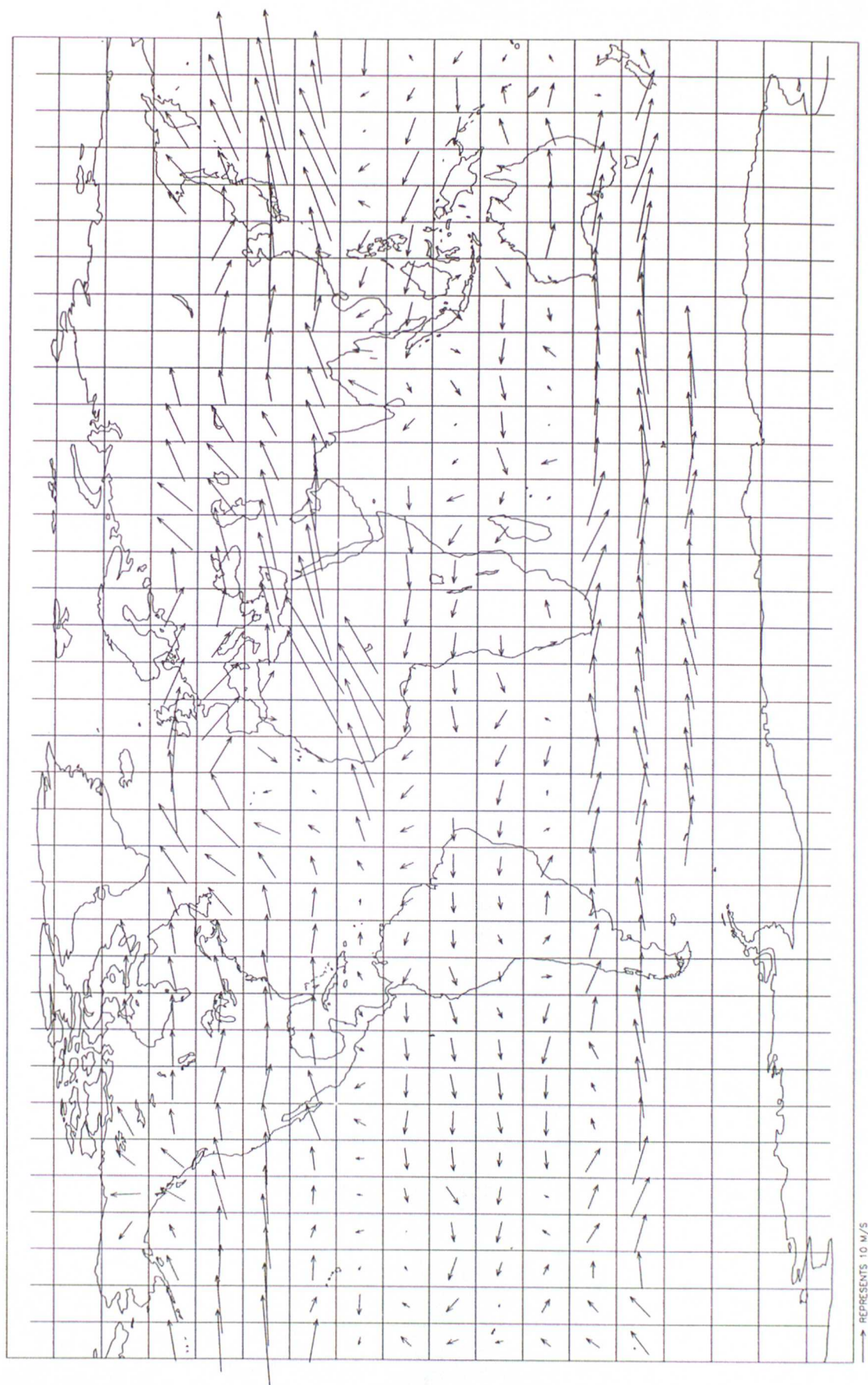


FIGURE 17

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA
FEBRUARY 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

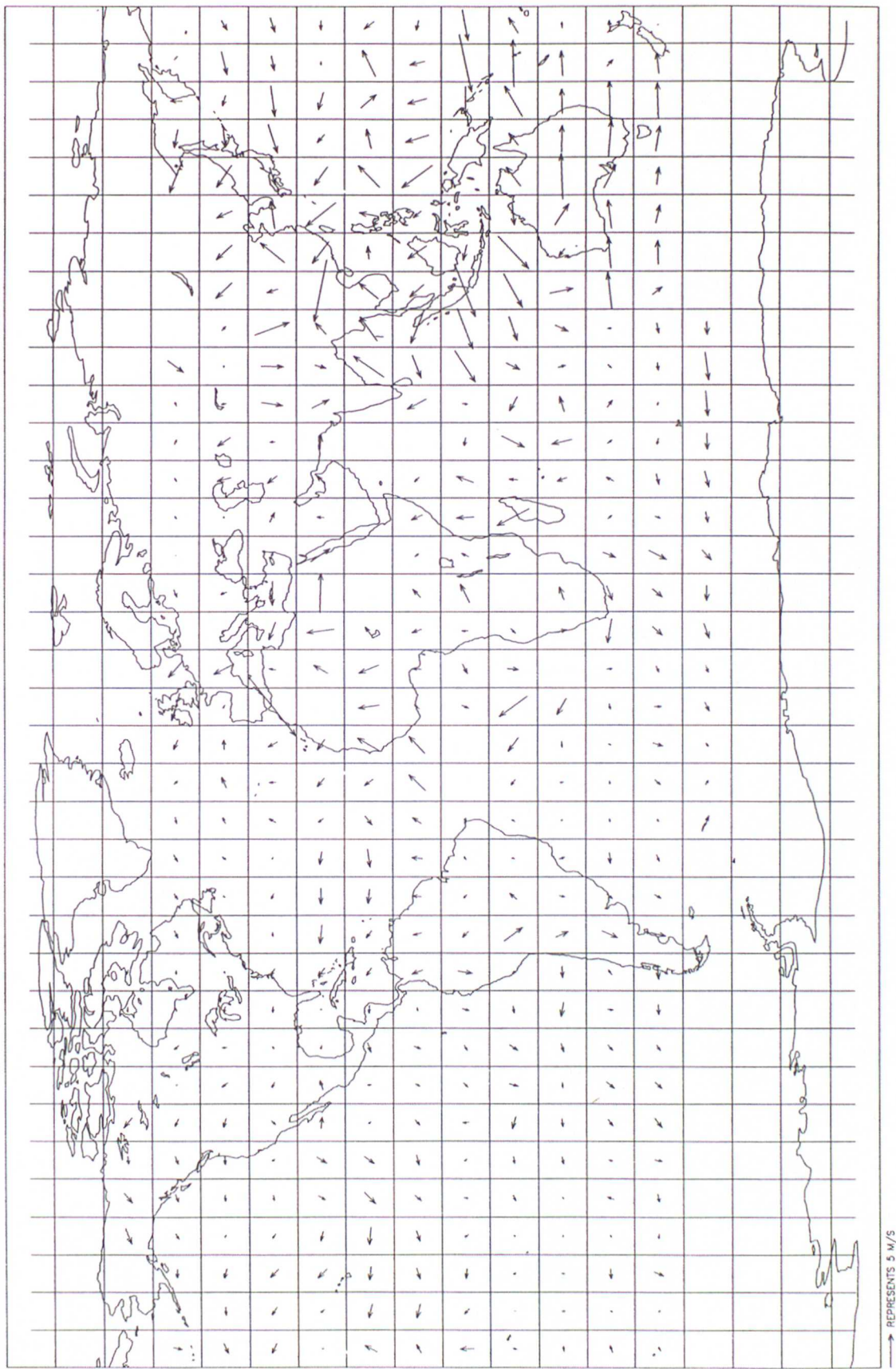
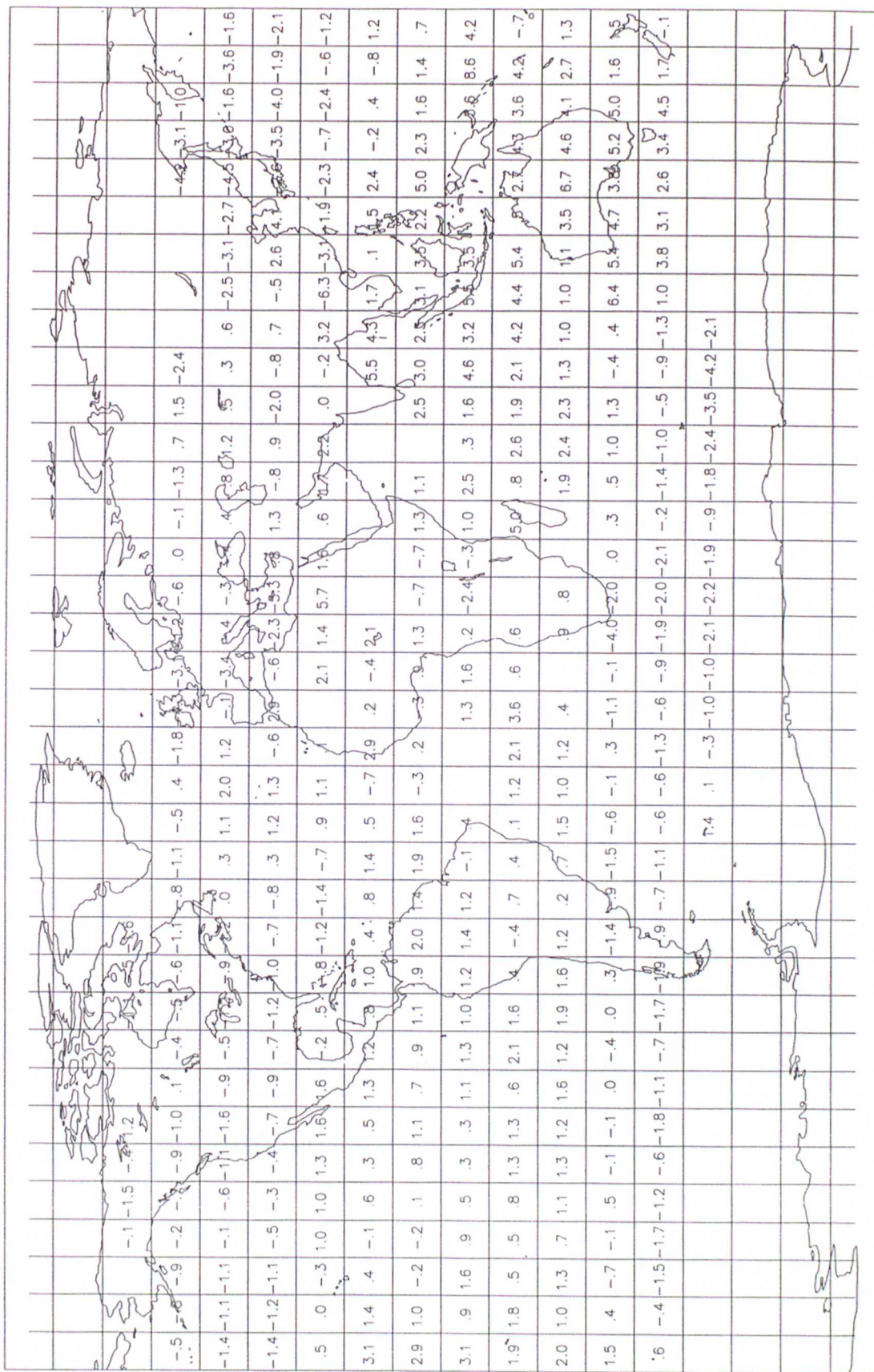


FIGURE 18



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
FEBRUARY 1999

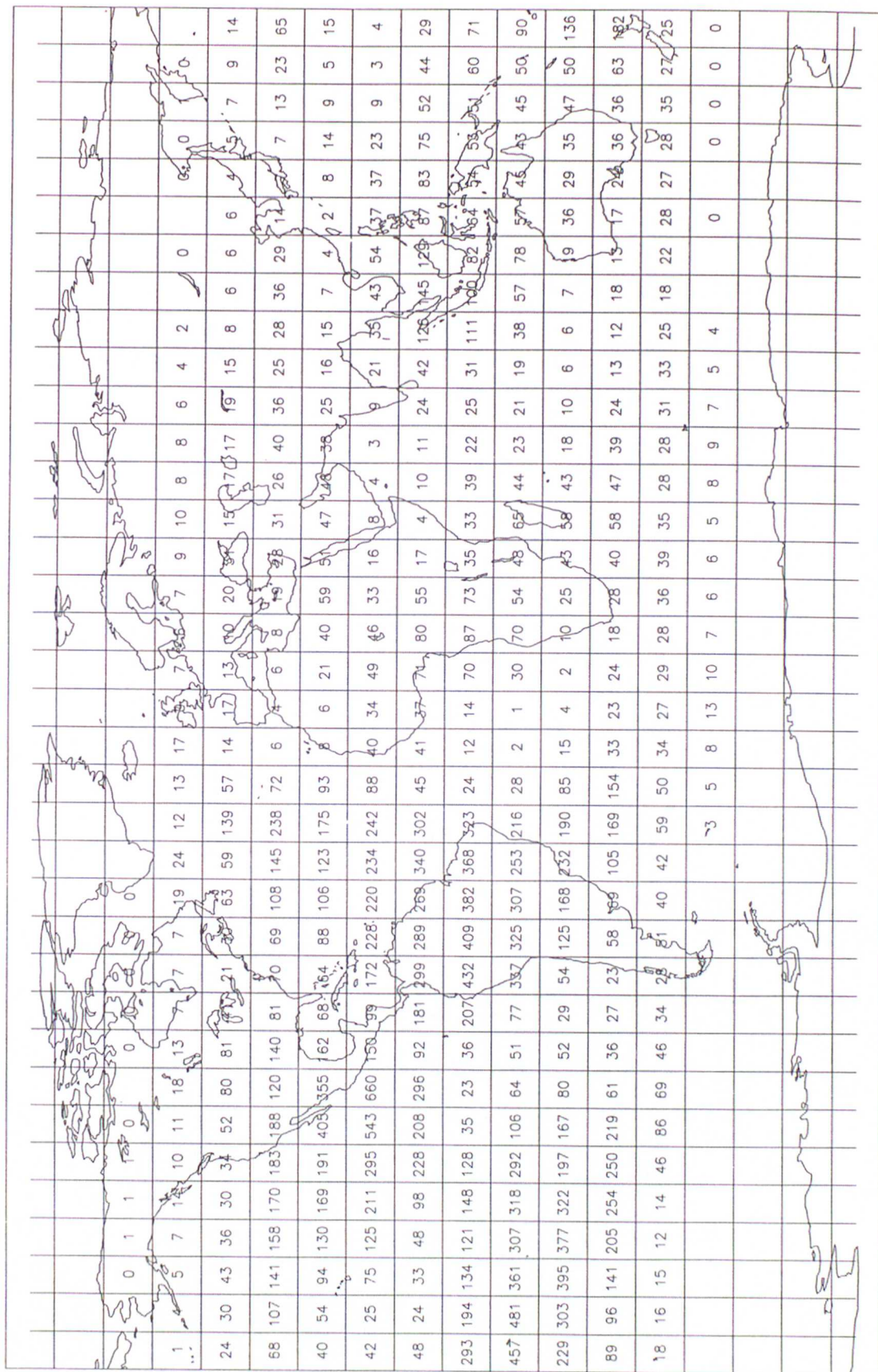


FIGURE 21

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101-400 HPA

FEBRUARY 1999

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

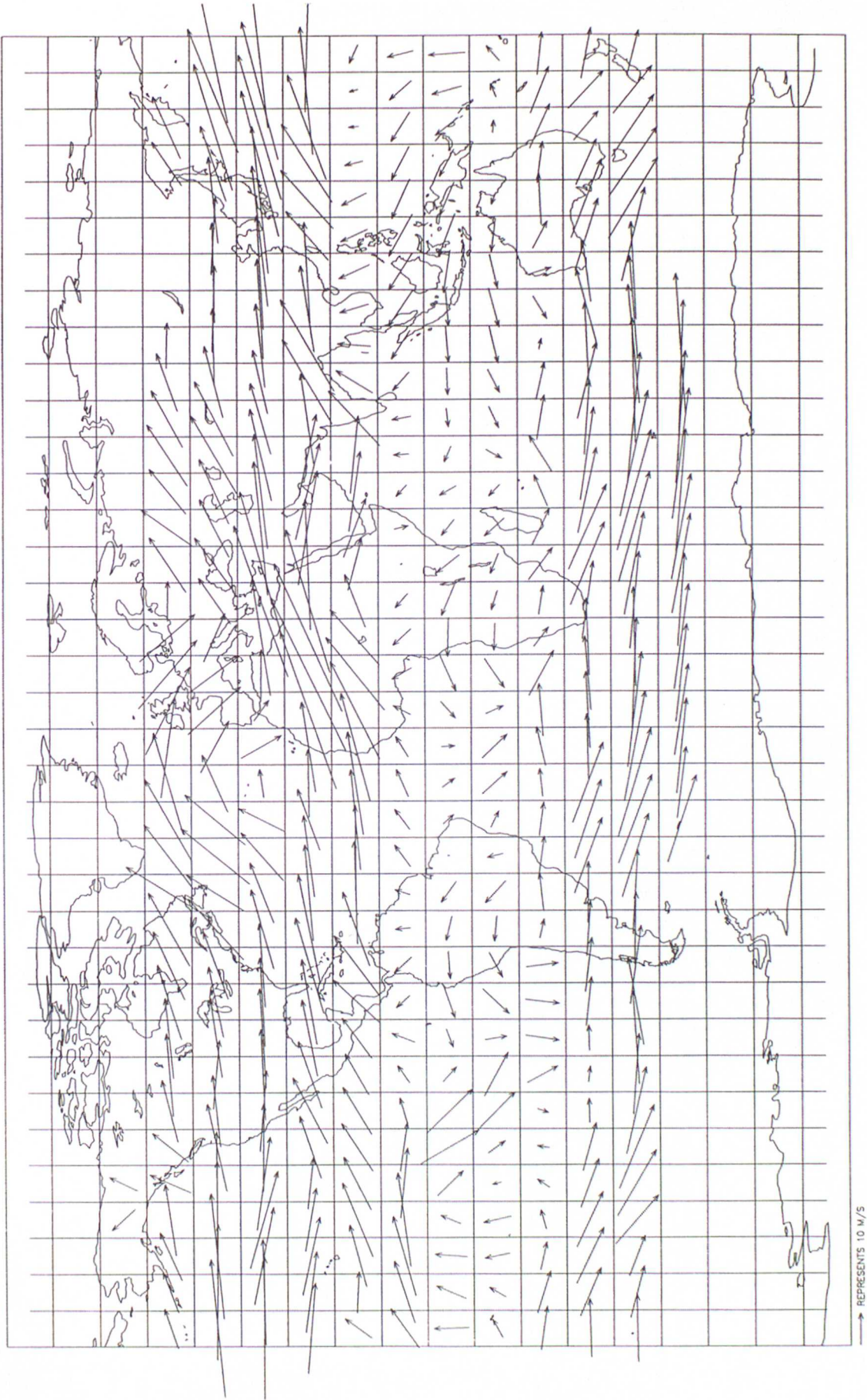


FIGURE 22

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA
FEBRUARY 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

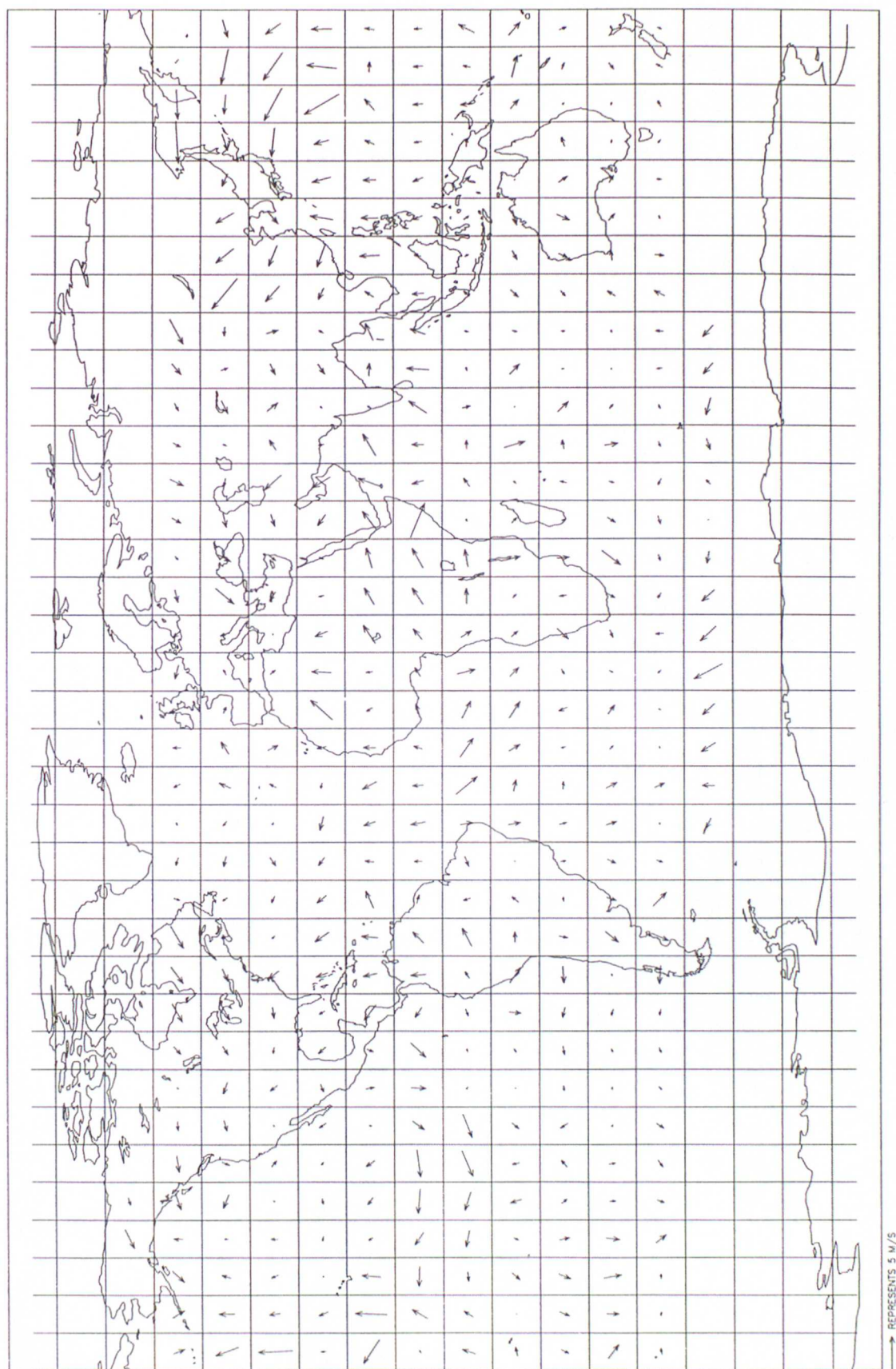
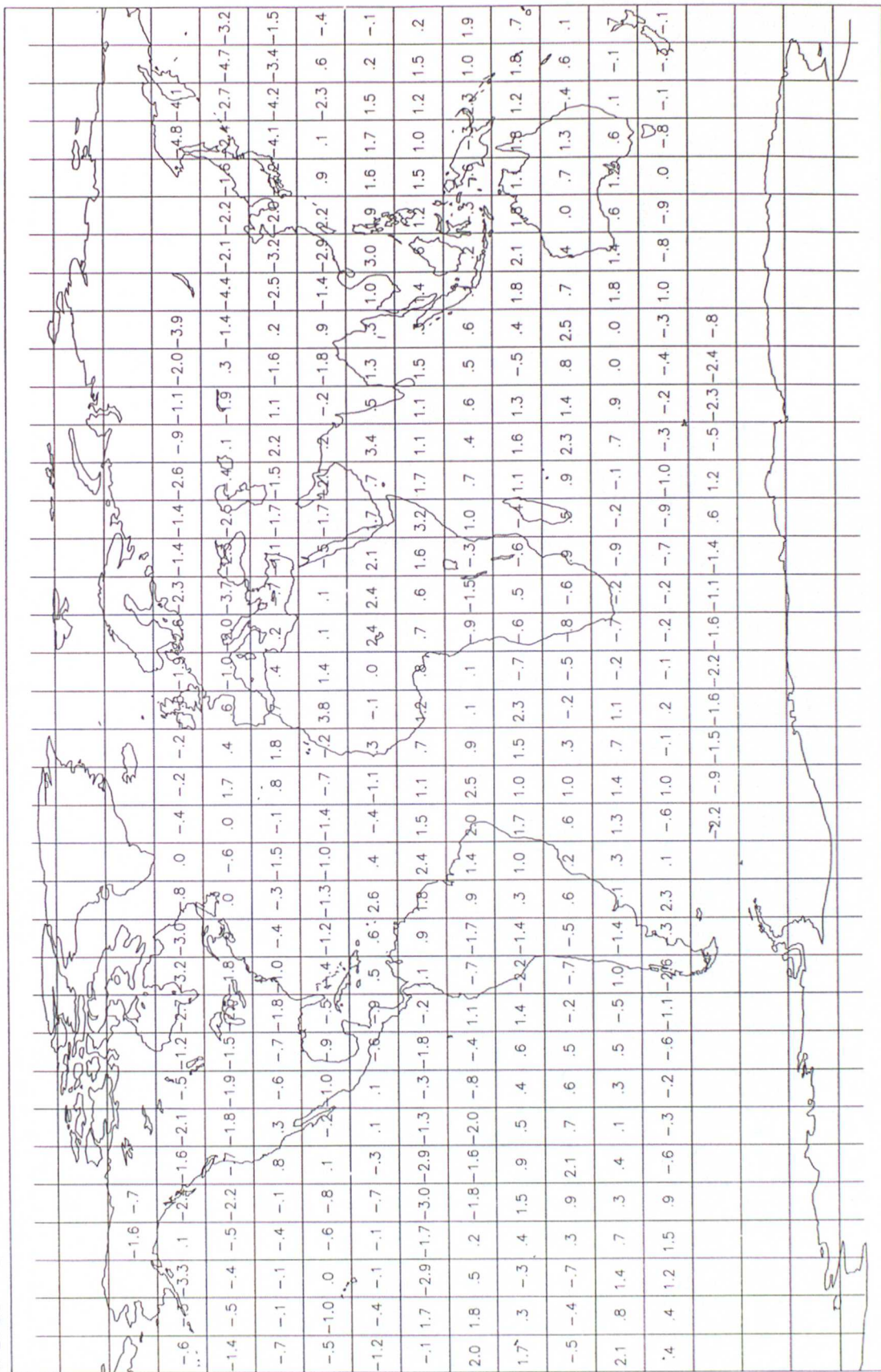
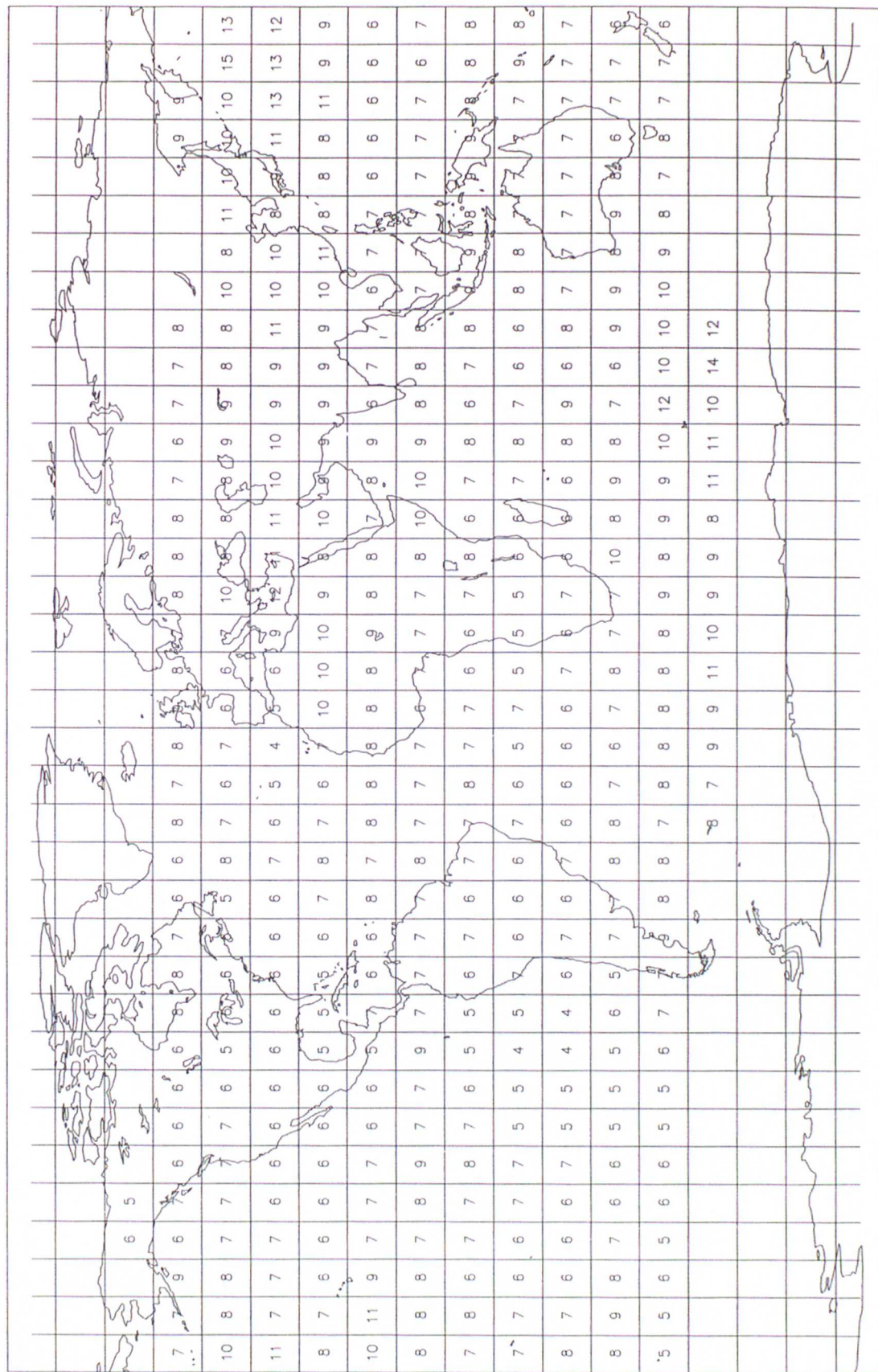


FIGURE 23



SATOB5 : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA
FEBRUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: February 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-11, NOAA-14 500 km.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:All SATEM soundings where number of observations > 30.
Data Extracted	:Layer: 850 - 1000 hPa 100 - 300 hPa 30 - 50 hPa :Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
 DATA TYPE:- DRIFTER
 MONITORING CENTRE: BRACKNELL
 MONTH: February 1999

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. A positive bias indicates the observation is veered to the background
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOURL	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13505	15.6	-27.9	ALL	P	SUR	762	2	0	0.8	-0.1	0.8
13507	23.1	-31.1	ALL	P	SUR	685	1	0	0.8	-0.1	0.8
13508	16.5	-33.7	ALL	P	SUR	662	0	0	0.8	0.2	0.9
13509	12.0	-31.1	ALL	P	SUR	625	0	0	0.8	-0.3	0.9
41502	20.9	-45.4	ALL	P	SUR	204	0	0	0.9	0.3	1.0
41503	24.8	-62.6	ALL	P	SUR	231	0	0	1.0	0.1	1.0
41504	25.0	-69.3	ALL	P	SUR	257	0	0	1.0	0.1	1.0
41505	31.6	-63.9	ALL	P	SUR	271	0	0	1.1	0.1	1.1
41521	27.3	-57.7	ALL	P	SUR	260	0	0	0.9	0.1	0.9
41528	27.3	-70.0	ALL	P	SUR	254	0	0	1.1	0.2	1.2
41598	27.0	-45.0	ALL	P	SUR	939	3	0	1.1	0.5	1.2
41599	26.3	-37.3	ALL	P	SUR	460	15	3	0.8	-0.2	0.8
41625	26.3	-73.3	ALL	P	SUR	245	0	0	1.0	0.0	1.0
41629	25.7	-67.7	ALL	P	SUR	246	0	0	1.0	0.1	1.0
41636	19.6	-60.4	ALL	P	SUR	493	31	6	1.3	0.4	1.4
41637	24.6	-48.6	ALL	P	SUR	294	3	1	1.0	0.5	1.1
41638	23.2	-61.9	ALL	P	SUR	571	3	1	1.3	0.4	1.4
44601	53.7	-27.9	ALL	P	SUR	534	54	10	2.0	1.0	2.2
44604	45.7	-21.7	ALL	P	SUR	181	0	0	2.0	1.0	2.2
44607	51.5	-46.0	ALL	P	SUR	442	1	0	2.1	0.2	2.1
44608	49.0	-47.3	ALL	P	SUR	654	0	0	1.7	0.0	1.7
44610	54.3	-42.5	ALL	P	SUR	212	0	0	2.2	0.3	2.2
44613	43.3	-21.3	ALL	P	SUR	1196	20	2	0.8	0.2	0.8
44616	57.6	-33.3	ALL	P	SUR	953	0	0	1.7	-0.1	1.7
44624	55.6	-37.8	ALL	P	SUR	878	2	0	1.6	-0.2	1.7
44726	60.9	-7.8	ALL	P	SUR	1489	21	1	1.7	0.4	1.8
44740	43.8	-51.5	ALL	P	SUR	1	0	0	0.0	-1.2	1.2
44742	45.4	-6.4	ALL	P	SUR	1183	9	1	1.2	0.0	1.2
44760	54.0	-11.8	ALL	P	SUR	1465	11	1	1.3	0.6	1.4
44762	39.8	-42.3	ALL	P	SUR	388	2	1	1.5	0.4	1.5
44764	51.1	-21.3	ALL	P	SUR	1099	6	1	1.3	0.1	1.3
44772	54.4	-11.4	ALL	P	SUR	757	16	2	2.7	0.2	2.7
44778	50.7	-25.7	ALL	P	SUR	1484	12	1	1.5	-0.1	1.5
44858	40.5	-69.4	ALL	P	SUR	1	0	0	0.0	0.5	0.5
44901	54.1	-12.3	ALL	P	SUR	216	0	0	1.1	1.4	1.8
62511	45.3	-17.3	ALL	P	SUR	663	25	4	1.0	0.6	1.2
62512	46.4	-17.5	ALL	P	SUR	161	0	0	1.3	0.6	1.4
62513	47.8	-10.7	ALL	P	SUR	608	23	4	1.1	0.5	1.2
62515	62.2	-10.8	ALL	P	SUR	2016	9	0	2.0	0.6	2.0
62517	46.8	-8.9	ALL	P	SUR	115	0	0	1.7	2.0	2.6
62518	42.1	-14.3	ALL	P	SUR	2	2	100	0.0	0.0	0.0
62519	37.6	-20.1	ALL	P	SUR	970	6	1	0.8	0.1	0.8
62520	42.5	-20.0	ALL	P	SUR	903	1	0	1.0	-0.1	1.0
62554	45.4	-14.7	ALL	P	SUR	941	2	0	1.0	0.3	1.0
62674	63.4	-20.3	ALL	P	SUR	286	0	0	2.2	0.1	2.2
64517	64.1	-29.9	ALL	P	SUR	241	1	0	2.4	0.2	2.4
64518	64.4	-27.4	ALL	P	SUR	478	0	0	2.0	-0.1	2.0
64520	64.4	-32.2	ALL	P	SUR	531	0	0	2.3	-0.8	2.4
64529	61.6	-17.1	ALL	P	SUR	1188	20	2	2.4	-0.8	2.5
64563	63.0	-8.5	ALL	P	SUR	5	5	100	0.0	0.0	0.0
64845	59.2	-11.7	ALL	P	SUR	1	0	0	0.0	1.3	1.3
65581	59.5	-9.4	ALL	P	SUR	447	2	0	1.7	-0.2	1.7
65591	57.1	-17.1	ALL	P	SUR	1339	6	0	1.8	-0.1	1.8
65592	61.6	-24.4	ALL	P	SUR	1043	11	1	2.4	-0.1	2.4
65593	61.1	-31.6	ALL	P	SUR	436	1	0	1.8	-0.3	1.9
65599	63.5	-30.5	ALL	P	SUR	2032	23	1	2.0	-0.2	2.0

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
41504	25.0	-69.3	ALL	SPEED	SUR	347	0	0	2.2	-1.8	2.8
41521	27.3	-57.7	ALL	SPEED	SUR	337	0	0	1.5	-0.3	1.6
41625	26.3	-73.3	ALL	SPEED	SUR	330	0	0	1.5	0.1	1.5
41629	25.7	-67.7	ALL	SPEED	SUR	343	0	0	1.7	-0.4	1.8
41636	19.6	-60.4	ALL	SPEED	SUR	497	0	0	1.7	-0.4	1.8
41637	24.6	-48.6	ALL	SPEED	SUR	305	0	0	1.7	1.0	2.0
41638	23.2	-61.9	ALL	SPEED	SUR	561	0	0	1.6	0.1	1.6
44601	53.7	-27.9	ALL	SPEED	SUR	327	1	0	2.2	0.2	2.3
44607	51.5	-46.0	ALL	SPEED	SUR	489	0	0	2.7	1.7	3.2
44740	43.8	-51.5	ALL	SPEED	SUR	1	0	0	0.0	-3.1	3.1
44762	39.8	-42.3	ALL	SPEED	SUR	417	0	0	3.3	1.0	3.5
44858	40.5	-69.4	ALL	SPEED	SUR	2	0	0	0.0	0.5	0.5
62515	62.2	-10.8	ALL	SPEED	SUR	2	0	0	0.0	1.3	1.3
62517	46.8	-8.9	ALL	SPEED	SUR	866	0	0	1.8	0.2	1.8
62518	42.1	-14.3	ALL	SPEED	SUR	6	0	0	2.8	-2.9	4.0
62519	37.6	-20.1	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
64845	59.2	-11.7	ALL	SPEED	SUR	1	0	0	0.0	2.3	2.3
65593	61.1	-31.6	ALL	SPEED	SUR	2	0	0	0.0	-15.0	15.0
65599	63.5	-30.5	ALL	SPEED	SUR	1793	4	0	3.6	0.3	3.6
89902	43.3	-9.9	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0

WIND DIRECTION

41502	20.9	-45.4	ALL	DIRN.	SUR	202	0	0	30.5	6.1	31.1
41503	24.8	-62.6	ALL	DIRN.	SUR	228	0	0	47.5	26.9	54.6
41504	25.0	-69.3	ALL	DIRN.	SUR	127	0	0	30.9	11.0	32.8
41521	27.3	-57.7	ALL	DIRN.	SUR	184	0	0	19.4	-15.4	24.8
41625	26.3	-73.3	ALL	DIRN.	SUR	141	0	0	30.4	7.3	31.3
41629	25.7	-67.7	ALL	DIRN.	SUR	141	0	0	18.5	7.5	20.0
41636	19.6	-60.4	ALL	DIRN.	SUR	179	0	0	21.9	10.0	24.1
41637	24.6	-48.6	ALL	DIRN.	SUR	112	0	0	28.8	-7.1	29.7
41638	23.2	-61.9	ALL	DIRN.	SUR	163	0	0	22.2	15.1	26.8
44601	53.7	-27.9	ALL	DIRN.	SUR	264	1	0	38.3	-7.5	39.0
44607	51.5	-46.0	ALL	DIRN.	SUR	347	0	0	28.1	2.8	28.2
44740	43.8	-51.5	ALL	DIRN.	SUR	1	0	0	0.0	-10.3	10.3
44762	39.8	-42.3	ALL	DIRN.	SUR	338	0	0	30.2	-16.2	34.3
62517	46.8	-8.9	ALL	DIRN.	SUR	458	0	0	13.4	-1.1	13.5
62519	37.6	-20.1	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0
64845	59.2	-11.7	ALL	DIRN.	SUR	1	0	0	0.0	-16.9	16.9
65599	63.5	-30.5	ALL	DIRN.	SUR	1042	4	0	32.0	-1.1	32.0
89902	43.3	-9.9	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 1999

Monitoring procedures:		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
AAL	2245	1	31	2.0	-0.1	1700	0	17	0	8.3	0.9
ACA	1169	1	16	2.3	-0.2	1042	0	7	0	7.6	0.5
AEA	145	1	29	2.4	1.1	128	0	23	0	8.5	2.1
AEL	593	0	22	2.0	-0.6	615	0	22	0	9.6	0.3
AEY	49	0	2	1.8	0.8	49	0	0	0	7.2	0.8
AFL	360	0	7	2.0	0.5	344	0	6	0	9.1	0.2
AFR	1309	1	15	1.8	0.0	1309	0	14	0	8.6	0.6
AIH	136	0	15	2.0	-0.1	122	0	11	0	9.4	0.9
AJM	58	0	3	1.8	-0.7	58	0	5	0	8.7	0.9
AMM	85	1	19	2.1	0.6	77	0	12	0	9.2	0.9
AMX	246	3	9	1.9	-0.2	249	1	8	0	8.2	1.0
ANZ	218	0	5	2.1	-0.8	216	0	5	0	6.7	-0.4
AOM	441	1	7	1.6	0.8	441	0	7	0	8.8	0.8
AVA	131	1	4	2.1	-0.6	135	1	6	0	7.5	0.7
AZA	513	1	30	2.6	0.2	423	0	20	0	8.0	1.0
BAL	308	0	24	1.9	-0.1	319	0	23	0	7.2	0.6
BAW	1371	1	26	2.3	-0.3	1220	0	19	0	7.9	1.0
BLX	46	0	9	1.3	-0.3	46	0	7	0	7.9	0.5
BWA	97	2	15	1.9	1.2	90	0	10	0	9.1	1.5
CDN	644	1	19	2.2	0.5	557	0	10	0	7.1	0.9
CFC	30	3	17	2.2	1.2	33	6	21	0	13.9	1.4
CFG	554	0	7	1.8	-0.8	535	0	5	0	9.4	0.4
CKT	86	1	14	2.2	1.1	82	1	7	0	7.0	0.6
CLX	355	1	14	2.3	-0.6	319	0	7	0	8.4	-0.1
CMM	48	2	21	1.6	0.4	41	0	12	0	4.7	1.3
COA	1025	1	28	2.1	-0.2	827	0	18	0	13.0	2.3
CRL	322	1	7	1.7	0.5	317	0	5	0	8.2	0.7
CTB	190	2	5	2.1	-0.6	195	0	3	0	6.8	0.2
CUB	271	1	16	1.5	0.5	261	0	13	0	8.7	1.1
DAL	1521	1	39	2.0	-0.6	1150	0	27	0	9.1	1.1
DBY	346	1	5	1.8	-1.0	346	0	5	0	8.9	0.3
DLH	2083	1	20	1.9	0.0	1856	0	15	0	7.8	0.4
EEZ	40	3	25	1.2	-0.8	38	8	26	0	6.3	-1.2
ELY	113	0	10	2.2	-0.3	116	0	11	0	11.1	0.6
EWV	88	1	24	2.2	0.0	70	0	10	0	9.7	1.4
FDX	546	1	31	2.2	0.2	412	0	15	0	9.0	1.1
FIN	429	1	19	2.1	0.2	344	0	10	0	7.9	0.2
GAF	31	3	39	2.6	-0.8	20	0	20	0	13.8	-2.5
GRL	28	0	4	1.9	0.4	28	0	4	0	6.1	0.0
GTI	68	0	35	1.4	-0.3	60	2	33	0	6.9	0.1
HLF	40	3	18	1.8	-1.2	36	0	11	0	6.6	1.8
IBE	1298	1	26	2.2	0.2	1249	0	24	0	8.9	0.9
ICE	818	1	28	2.1	0.2	639	0	17	0	8.0	0.2
JKK	137	2	28	1.9	-0.1	109	0	14	0	8.8	0.9
KLM	1925	0	16	2.0	0.2	1815	0	13	0	8.9	0.6
LDA	148	2	37	2.2	0.2	119	1	27	0	7.6	1.2
LDI	413	1	35	2.2	-0.9	355	0	28	0	8.2	0.3
LIB	146	0	3	1.5	0.9	152	0	4	0	7.9	1.2
LOT	164	1	21	2.1	-0.7	135	0	11	0	7.6	0.4
LTU	402	0	28	2.2	-0.3	302	0	15	0	8.9	1.4
MAS	51	0	14	2.0	-0.2	47	0	13	0	8.4	1.3
MPD	55	4	33	2.7	-0.2	46	0	24	0	10.0	1.1
MPH	479	1	10	1.9	-0.4	461	0	5	0	8.5	0.4
NCA	22	0	0	1.6	-0.2	22	0	0	0	7.2	0.3
NWA	2584	1	11	2.0	0.7	2420	0	6	0	8.4	0.8
OAL	36	0	22	3.1	2.3	35	0	14	0	5.1	1.8
PAC	98	0	21	2.3	0.3	89	1	19	0	11.4	1.7
RAM	54	0	7	2.4	-1.2	54	0	6	0	8.4	1.3
RCH	168	2	19	1.9	0.3	158	0	25	0	10.1	1.8

IDENT.	N.REP.	TEMPERATURE				N.REP.	PG	WIND			RMS	BIAS
		PG	PR	RMS	BIAS			PR	PC			
RRR	104	1	25	1.8	0.1	95	0	24	0	8.1	2.3	
SAB	73	1	26	2.7	-0.4	62	0	16	0	8.4	0.3	
SAS	1352	0	2	2.0	-0.1	1349	0	2	0	7.9	0.4	
SEU	39	3	33	2.3	1.3	36	0	22	0	9.8	-0.1	
SIA	153	1	4	2.5	-0.9	162	0	5	0	9.4	1.1	
SLR	128	0	18	1.9	-0.9	139	0	19	0	8.7	0.7	
SVA	99	0	10	2.2	-0.9	105	0	8	0	8.4	1.1	
SWR	148	1	20	1.9	-0.2	132	1	14	0	7.6	0.8	
TAP	282	1	11	1.8	-0.2	277	1	10	0	9.3	1.3	
TOW	69	4	25	2.3	-0.1	51	0	10	0	8.3	2.1	
TWA	902	3	33	2.4	0.3	652	0	21	0	8.7	1.1	
UAL	1881	1	18	2.1	-0.1	1665	0	11	0	7.7	0.7	
UPS	632	1	37	2.0	0.3	537	0	32	0	8.7	0.3	
USA	264	2	33	1.9	-0.4	204	0	21	0	7.6	1.4	
VIR	309	1	16	2.1	-0.4	277	0	8	0	7.8	0.8	
VKG	35	0	0	1.5	0.1	41	0	0	0	8.0	2.4	
WOA	82	0	15	2.0	0.3	79	0	100	0	9.3	-0.4	
BA	6563	0	1	1.5	0.1	6560	0	1	0	6.9	1.0	
KL	3783	0	1	2.0	1.1	3785	0	1	0	6.9	0.8	
N	261	0	11	2.5	0.6	243	0	9	0	8.7	0.5	
ADS	437	0	3	1.4	-0.1	437	0	3	0	6.2	-0.2	
US ACARS	11262	0	5	1.7	0.3	11262	0	2	0	7.1	1.1	

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	12	Z	100	13	0	17.8	18.8	6.1
ELML7	00	Z	100	14	0	20.4	24.3	13.2
ELML7	12	Z	100	14	0	11.6	24.3	21.4
F/OU	00	Z	100	1	0	0.0	43.0	43.0
FNOR	00	Z	100	12	0	19.3	39.6	34.6
FNOR	12	Z	100	14	0	16.3	25.7	19.9
FNOU	00	Z	100	17	0	13.6	19.3	13.6
FNOU	12	Z	100	17	0	17.4	24.7	17.5
FNPB	00	Z	100	4	0	15.4	16.7	6.5
FNPB	12	Z	100	2	1	1.5	9.6	-9.5
FNRS	00	Z	100	12	0	11.7	11.8	0.8
FNRS	12	Z	100	8	0	11.8	12.2	3.4
JBOA	00	Z	100	1	0	0.0	103.0	-103.0
JDWX	00	Z	100	1	0	0.0	21.0	21.0
JGQH	00	Z	100	1	0	0.0	21.0	21.0
LDWR	00	Z	100	27	0	13.8	15.2	6.4
LDWR	12	Z	100	24	0	11.2	12.0	4.2
OVYA2	00	Z	100	11	0	22.8	25.8	-12.1
OVYA2	12	Z	100	9	0	14.4	19.5	-13.2
OXTS2	00	Z	100	13	0	16.7	20.9	-12.5
OXTS2	12	Z	100	9	0	14.1	14.1	0.8
SHIP	00	Z	100	1	0	0.0	63.0	63.0
V2XM	00	Z	100	3	0	7.5	22.6	21.3
V2XM	12	Z	100	2	0	5.0	41.3	41.0
WTEC	00	Z	100	1	0	0.0	3.0	3.0
XXBA	00	Z	100	1	0	0.0	204.0	204.0
03953	00	Z	100	22	0	13.6	13.6	-0.2
03953	12	Z	100	25	0	14.8	15.3	3.6
04018	00	Z	100	24	0	20.4	22.9	10.3
04018	12	Z	100	26	0	20.4	23.9	12.5
04220	00	Z	100	9	0	12.4	19.2	14.7
04220	12	Z	100	11	0	55.0	56.4	-12.5
04270	00	Z	100	26	0	30.8	32.0	-8.8
04270	12	Z	100	24	0	22.0	23.2	-7.3
04339	00	Z	100	22	0	20.8	22.3	7.9
04339	12	Z	100	25	0	17.3	17.5	2.9
04360	00	Z	100	22	0	17.2	19.4	9.0
04360	12	Z	100	23	0	17.6	18.2	4.7
08001	00	Z	100	16	0	12.1	16.3	11.0
08001	12	Z	100	22	0	15.4	20.3	13.3
08508	00	Z	100	1	0	0.0	4.0	-4.0
08508	12	Z	100	9	0	18.0	18.4	4.0
08522	00	Z	100	1	0	0.0	1.0	1.0
08522	12	Z	100	26	1	13.7	14.2	3.9
08594	00	Z	100	1	0	0.0	10.0	10.0
08594	12	Z	100	17	0	19.0	29.8	23.0
60020	12	Z	100	1	0	0.0	24.0	24.0
71600	00	Z	100	26	0	20.5	36.1	29.7
71600	12	Z	100	27	0	18.0	23.1	14.5
72201	00	Z	100	25	0	26.6	29.9	13.8
72201	12	Z	100	25	0	15.9	18.1	8.8
72402	00	Z	100	25	0	13.9	14.9	5.4
72402	12	Z	100	23	0	11.6	11.7	0.6
74494	00	Z	100	22	0	13.1	14.1	5.2
74494	12	Z	100	25	0	12.5	22.3	-18.5
78016	12	Z	100	26	0	13.6	18.2	12.2

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 1999

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS		:Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	12	Z	500	13	0	16.2	16.4	2.8
DBLK	00	Z	500	1	0	0.0	14.0	-14.0
ELML7	00	Z	500	15	0	13.0	15.4	8.3
ELML7	12	Z	500	14	0	14.1	18.4	11.9
F/OU	00	Z	500	1	0	0.0	12.0	-12.0
FNOR	00	Z	500	13	0	11.5	30.6	28.4
FNOR	12	Z	500	15	0	9.9	24.0	21.9
FNOU	00	Z	500	17	0	13.4	23.9	19.8
FNOU	12	Z	500	18	0	12.5	21.9	17.9
FNPH	00	Z	500	4	0	5.0	16.5	15.8
FNPH	12	Z	500	3	0	48.8	52.6	-19.7
FNRS	00	Z	500	13	0	10.5	16.7	12.9
FNRS	12	Z	500	11	0	10.4	18.2	14.9
JBOA	00	Z	500	1	0	0.0	7.0	-7.0
JCCX	00	Z	500	1	0	0.0	14.0	14.0
JDWX	00	Z	500	1	0	0.0	0.0	0.0
JGQH	00	Z	500	1	0	0.0	6.0	6.0
LDWR	00	Z	500	27	0	21.0	21.5	4.5
LDWR	12	Z	500	25	0	18.6	18.7	-1.6
OVYA2	00	Z	500	13	0	9.8	13.9	-9.8
OVYA2	12	Z	500	10	0	18.3	26.5	-19.2
OXTS2	00	Z	500	13	0	19.2	19.6	3.9
OXTS2	12	Z	500	11	0	20.3	21.2	-6.1
RAN	00	Z	500	1	0	0.0	95.0	95.0
SHIP	00	Z	500	1	0	0.0	44.0	44.0
SHIPBX	00	Z	500	1	0	0.0	8.0	8.0
V2XM	00	Z	500	3	0	5.4	13.5	12.3
V2XM	12	Z	500	2	0	0.0	15.0	15.0
WTEC	00	Z	500	1	0	0.0	28.0	28.0
XXBA	00	Z	500	1	0	0.0	5.0	-5.0
XXBA	12	Z	500	3	0	5.1	9.5	8.0
03953	00	Z	500	27	0	12.0	17.9	13.3
03953	12	Z	500	27	0	13.6	19.8	14.4
04018	00	Z	500	26	0	12.3	16.7	11.4
04018	12	Z	500	28	0	19.4	20.8	7.5
04220	00	Z	500	27	0	16.8	16.9	-1.7
04220	12	Z	500	26	1	22.4	24.8	-10.6
04270	00	Z	500	27	0	17.5	17.8	3.6
04270	12	Z	500	28	0	15.2	15.2	0.1
04339	00	Z	500	23	0	16.5	16.5	-0.6
04339	12	Z	500	25	0	10.8	10.9	1.6
04360	00	Z	500	23	0	13.5	14.0	-4.0
04360	12	Z	500	24	0	17.0	18.5	-7.3
08001	00	Z	500	22	0	17.4	21.7	13.0
08001	12	Z	500	24	0	14.2	16.7	8.8
08508	00	Z	500	1	0	0.0	1.0	1.0
08508	12	Z	500	27	0	9.8	15.0	11.3
08522	00	Z	500	1	0	0.0	12.0	12.0
08522	12	Z	500	26	1	10.7	24.7	22.3
08594	00	Z	500	1	0	0.0	1.0	1.0
08594	12	Z	500	19	0	8.2	10.0	5.8
60020	00	Z	500	26	0	7.4	13.8	11.6
60020	12	Z	500	28	0	10.4	18.5	15.4
71600	00	Z	500	26	0	9.2	16.3	13.4
71600	12	Z	500	27	0	14.4	14.6	2.6
72201	00	Z	500	25	0	7.6	15.1	13.0
72201	12	Z	500	25	0	6.3	7.4	4.0
72402	00	Z	500	25	0	16.0	16.1	-1.5
72402	12	Z	500	26	0	11.9	14.1	-7.5
74494	00	Z	500	25	0	10.8	11.9	5.0
74494	12	Z	500	26	0	8.4	10.0	-5.4
78016	12	Z	500	26	0	9.4	16.8	13.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	12	V	100	9	0	0	0.0	-0.1	3.7
ELML7	00	V	100	9	0	0	0.0	0.8	0.7
ELML7	12	V	100	14	0	0	0.0	-3.2	2.2
F/OU	00	V	100	1	0	0	4.9	1.5	3.9
FNOR	00	V	100	8	0	0	4.9	-3.1	0.7
FNOR	12	V	100	12	0	0	4.9	0.2	-0.4
FNOU	00	V	100	16	0	0	3.2	-0.3	0.6
FNOU	12	V	100	15	0	6	2.0	-1.0	0.8
FNPH	00	V	100	4	0	0	2.5	-1.2	-1.3
FNPH	12	V	100	2	0	0	2.5	-1.4	0.5
FNRS	00	V	100	9	0	0	2.5	1.0	0.3
FNRS	12	V	100	8	0	0	2.5	-1.1	2.2
JBOA	00	V	100	1	0	0	2.5	-2.2	6.7
JDWX	00	V	100	1	0	0	2.5	-1.6	0.8
JGQH	00	V	100	1	0	0	2.5	-2.7	1.7
LDWR	00	V	100	26	0	0	2.5	-0.5	-0.3
LDWR	12	V	100	24	0	0	2.4	0.0	-0.7
OVYA2	00	V	100	8	0	0	2.5	-0.3	-1.3
OVYA2	12	V	100	9	0	0	2.5	0.0	-1.1
OXTS2	00	V	100	10	0	0	2.5	-0.2	-0.2
OXTS2	12	V	100	8	0	12	2.2	-2.3	2.5
V2XM	00	V	100	3	0	0	2.2	-0.2	-2.3
V2XM	12	V	100	2	0	0	2.2	-1.1	-0.9
WTEC	00	V	100	1	0	0	2.2	2.0	-1.0
03953	00	V	100	22	0	0	4.1	-1.7	0.0
03953	12	V	100	25	0	0	2.6	-1.1	1.4
04018	00	V	100	23	0	0	3.0	-0.7	0.8
04018	12	V	100	25	0	0	2.9	-0.1	0.1
04220	00	V	100	5	0	0	2.7	1.7	2.1
04220	12	V	100	10	0	0	2.7	0.5	1.2
04270	00	V	100	19	0	0	3.9	2.4	0.6
04270	12	V	100	21	0	0	6.6	-0.1	1.6
04339	00	V	100	20	0	10	2.9	-1.0	1.8
04339	12	V	100	25	0	0	5.3	0.7	-0.3
04360	00	V	100	22	0	9	3.7	-3.3	0.9
04360	12	V	100	22	0	9	7.2	-3.3	0.5
08001	00	V	100	15	0	0	4.0	0.6	0.2
08001	12	V	100	22	0	0	4.4	-1.0	0.8
08508	00	V	100	1	0	0	2.6	10.6	-9.7
08508	12	V	100	4	0	0	2.6	-0.5	-1.5
08594	00	V	100	1	0	0	2.6	-4.4	5.8
08594	12	V	100	19	0	0	2.6	-3.0	4.4
60020	12	V	100	1	0	0	3.0	-1.4	2.8
71600	00	V	100	26	0	0	4.5	-0.1	0.1
71600	12	V	100	27	0	0	2.2	1.3	-0.9
72201	00	V	100	25	0	0	3.7	0.1	-1.2
72201	12	V	100	25	0	0	3.9	-0.7	-0.3
72402	00	V	100	23	0	0	2.0	1.4	-0.2
72402	12	V	100	22	0	0	4.4	-0.3	-0.4
74494	00	V	100	22	0	0	4.4	-0.1	-0.4
74494	12	V	100	25	0	0	2.2	-0.1	0.7
78016	12	V	100	25	0	0	5.0	-0.7	1.2

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
 MONITORING CENTRE: BRACKNELL
 MONTH: February 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	12	V	500	10	0	0	0.0	1.2	1.2
DBLK	00	V	500	1	0	0	4.7	9.6	5.5
ELML7	00	V	500	11	0	0	4.7	1.2	-0.2
ELML7	12	V	500	13	0	0	3.6	-0.1	0.8
F/OU	00	V	500	1	0	0	2.6	-3.4	-2.4
FNOR	00	V	500	9	0	0	2.6	0.8	-0.5
FNOR	12	V	500	13	0	0	2.6	-1.4	-0.2
FNOU	00	V	500	16	0	0	2.4	-0.3	0.8
FNOU	12	V	500	18	0	5	3.7	0.3	0.4
FNPB	00	V	500	4	0	0	4.5	-0.6	-0.2
FNPB	12	V	500	2	0	0	4.5	1.3	1.1
FNRS	00	V	500	9	0	0	4.5	-2.7	-0.4
FNRS	12	V	500	10	0	0	4.5	1.1	-0.8
JBOA	00	V	500	1	0	0	2.9	-3.1	0.3
JCCX	00	V	500	1	0	0	2.9	1.5	0.5
JDWX	00	V	500	1	0	0	2.9	3.2	-0.3
JGQH	00	V	500	1	0	0	2.9	-0.2	0.4
KASH	00	V	500	1	0	0	2.9	1.3	-1.3
LDWR	00	V	500	27	0	0	2.9	-1.0	-0.1
LDWR	12	V	500	25	0	0	4.1	1.1	0.1
OVYA2	00	V	500	11	0	0	3.6	0.9	-0.5
OVYA2	12	V	500	10	0	0	6.0	1.2	0.4
OXTS2	00	V	500	13	0	0	4.6	-1.3	-0.4
OXTS2	12	V	500	10	0	0	3.7	-0.1	-0.8
RAN	00	V	500	1	0	0	4.5	-1.6	-0.3
SHIPBX	00	V	500	1	0	0	4.5	0.3	-0.9
V2XM	00	V	500	3	0	0	8.3	2.3	-3.2
V2XM	12	V	500	2	0	0	8.3	0.7	-2.7
WTEC	00	V	500	1	0	0	8.3	-0.4	-0.2
03953	00	V	500	27	0	0	4.2	0.6	-0.6
03953	12	V	500	26	0	0	3.9	0.1	-0.7
04018	00	V	500	26	0	0	4.7	0.6	-0.4
04018	12	V	500	27	0	0	4.2	-0.2	0.4
04220	00	V	500	24	0	0	4.1	1.1	1.3
04220	12	V	500	23	0	0	4.9	1.0	-0.9
04270	00	V	500	22	0	0	6.2	2.0	0.0
04270	12	V	500	24	0	0	4.5	0.8	-0.5
04339	00	V	500	21	0	0	5.4	-0.3	2.0
04339	12	V	500	25	0	0	5.6	1.6	0.4
04360	00	V	500	22	0	0	5.3	-0.7	0.3
04360	12	V	500	24	0	4	4.6	-2.9	1.5
08001	00	V	500	21	0	0	4.0	-0.3	-3.6
08001	12	V	500	24	0	0	5.3	0.3	-1.7
08508	00	V	500	1	0	0	4.0	0.5	2.9
08508	12	V	500	23	0	0	4.0	0.3	0.5
08594	00	V	500	1	0	0	4.9	-2.6	1.1
08594	12	V	500	22	0	0	4.9	-0.7	0.9
60020	00	V	500	26	0	0	2.3	-0.1	-0.2
60020	12	V	500	28	0	0	2.6	-0.9	-0.4
71600	00	V	500	26	0	0	4.3	0.1	0.5
71600	12	V	500	27	0	0	4.5	0.7	0.7
72201	00	V	500	25	0	0	3.7	0.8	-1.7
72201	12	V	500	25	0	0	2.8	0.3	-1.4
72402	00	V	500	23	0	0	1.4	0.5	1.1
72402	12	V	500	25	0	0	4.1	0.6	0.1
74494	00	V	500	24	0	0	3.1	0.2	0.3
74494	12	V	500	26	0	0	3.1	0.1	0.2
78016	12	V	500	26	0	0	4.0	1.8	0.5

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45